



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

ORGANIZATIONAL USE OF A FRAMEWORK FOR INNOVATION ADOPTION

by

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September 2011

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REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE September 2011	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE Organizational Use of a Framework for Innovation Adoption			5. FUNDING NUMBERS	
6. AUTHOR(S) Scott Avery Voigts				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number NPS-2011-0057-IR-EP7-A.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited			12b. DISTRIBUTION CODE A	
13. ABSTRACT (maximum 200 words) This research examines organizational theory to gain understanding about the tradeoffs organizations are required to make in order to adopt innovations. As a framework for identifying gaps in current processes, the eight practices identified by Denning and Dunham's <i>The Innovator's Way, Essential Practices For Successful Innovation</i> (2010) are introduced. The eight practices are also provided as a tool to improve communications, focus, and methods for achieving innovation adoption within an organization.				
14. SUBJECT TERMS Innovation Adoption, Ambidextrous Organization, Exploration / Exploitation Tradeoff, The Innovator's Way			15. NUMBER OF PAGES 105	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18

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**ORGANIZATIONAL USE OF A FRAMEWORK
FOR INNOVATION ADOPTION**

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MANAGEMENT

from the

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ABSTRACT

This research examines organizational theory to gain understanding about the tradeoffs organizations are required to make in order to adopt innovations. As a framework for identifying gaps in current processes, the eight practices identified by Denning and Dunham's *The Innovator's Way, Essential Practices For Successful Innovation* (2010) are introduced. The eight practices are also provided as a tool to improve communications, focus, and methods for achieving innovation adoption within an organization.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACTD	Advanced Concept Technology Demonstration
C4I	Command, Control, Communications, Computers, and Intelligence
DACP	Defense Acquisition Challenge Program
DARPA	Defense Advanced Research Project Agency
DoD	Department of Defense
FMF	Fleet Marine Force
GAO	Government Accountability Office
HQMC	Headquarters Marine Corps
JROC	Joint Requirements Oversight Council
MCPD	Marine Corps Planning Process
MCRC	Marine Corps Recruiting Command
MCRDAC	Marine Corps Research Development and Acquisition Command
MARCORSYSCOM	Marine Corps Systems Command
MCWL	Marine Corps Warfighting Lab
MOS	Military Occupational Skills
ONR	Office of Naval Research
ONS	Operational Needs Statement
PG	Product Groups
POR	Program of Record
PM	Project Manager
SOP	Standard Operating Procedures
TRL	Technology Readiness Level
TTI	Technology Transition Initiative

USMC	United States Marine Corps
W3C	World Wide Web Consortium

ACKNOWLEDGMENTS

First, I would like to thank my wife, Kris, for her support, love, and ideas that have helped me to always look at a problem through a different lens. Without your encouragement, cheerleading, and willingness to take care of the home fires, I would have not applied for or graduated from school.

Second, to my son, William, thank you for your understanding, encouragement, love, and determination to figure things out. You are a constant source of inspiration.

Third, to my friend and mentor, Scott Bey, thank you for encouraging me to come to NPS. Without your influence, I would not have applied to school, and I would not have been able to experience the academic environment that encourages out-of-the-box thinking.

Fourth, I would like to thank the many professionals that I had the privilege of interviewing and getting to know as part of this project. Your words provided a baseline for how I viewed the problem at hand.

Fifth, I would like to thank the Acquisitions Research Program for providing funding, editing, and the resources that ensured the success of this thesis.

Lastly, I wish to thank Professor Nicholas Dew and Professor John Osmundson, whose valuable insight and guidance made the completion of this project possible.

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INTRODUCTION

A. PROBLEM STATEMENT

Individuals and organizations alike are constantly looking for inventions and ideas to improve market share, effectiveness, and to reduce their bottom lines, yet a good majority of innovations that are attempted fail. In research conducted by the GAO (2005), identified were 68 projects initiated and funded through three separate technology transfer programs used within the Department of Defense (DoD), and of those 68, only 20 (29%) were reported as complete with the following note: “It is important to note that, even though 20 TTI and Quick Reaction Fund projects are considered to be complete, not all of the capabilities have reached the warfighter” (2005, p. 12). Logically, it would be safe to assume that if the completed project fails to provide the warfighter a capability, the technology will be canceled and have an end result of failure. Additionally, “according to *Business Week* in August 2005, our overall success rate with innovation initiatives is an abysmal 4%” (Denning & Dunham, 2010, p. 3), indicating that there significant challenges in bringing innovations through to successful adoption.

When thinking about the low success rates among innovation initiatives, one can quickly become overwhelmed with all the possible factors that may have a positive or a negative impact on the overall success of the innovation initiative. Factors such as: the risk involved, the schedule available to develop the innovation, the organizational structure and culture, and the cost to develop versus revenue stream that will come in as a result of the innovation coming to fruition, all play a role in the ultimate success of the innovation initiative.

The Innovator’s Way, Essential Practices For Successful Innovation (Denning & Dunham, 2010) was written as a guide for an innovator to become more proficient in the skills that are required for innovation adoption, and to help the innovator identify and overcome barriers that result in the low innovation initiative success rate. Becoming better at innovation adoption has several benefits such as: less wasted resources because innovation initiatives that will not produce a benefit can be canceled in lieu of another

initiative that will produce a benefit, ensuring that the end user is receiving an innovation that they will want to use and maintain, and the potential for faster technology transfer because barriers can be realized and overcome early. With these potential benefits in mind, this thesis studies if, and how, *The Innovator's Way* can apply to an organization such as the Marine Corps.

B. BACKGROUND

The original purpose of this research was to determine whether project managers (PM) had any effect on the successful adoption of innovations into the Marine Corps. The original research plan was to interview PMs. At Marine Corps Systems Command (MARCORSYSCOM) and determine how the PMs used the practices identified in *The Innovator's Way* as methods for innovation adoption. The plan intended to ask PMs questions to elicit an individual response on how the individual PM conducted each of the eight practices so that comparisons between experienced, and less experienced PMs could be made. During the interviews, I realized that there were different views between the interviewees and me about the term “innovation” and how the term was used. Additionally, although the interview questions were structured to elicit an individual responses, the answers provided by the PMs centered on how MARCORSYSCOM accomplished acquisitions as an organization rather than how the individual PM might go about implementing each of the eight practices. Due to the differing views about the definition and usage of the term innovation, and the answers provided by the PMs during the interviews being centered on how the organization goes about accomplishing an acquisition, it became clear that something was missing in the research design. This research was subsequently transitioned away from the original area of focus to a new focus on creating a framework for successful adoption of innovation built from *The Innovator's Way*. The research now focuses on trying to answer the research question, how does *The Innovator's Way* apply to innovation adoption within the Marine Corps.

1. *The Innovator's Way*

In *The Innovator's Way*, three perspectives were provided that must be understood in order to grasp the researcher's a priori thoughts on the importance of their

research. The first perspective provides a clear and shared understanding of what innovation is; the second perspective outlines the eight practices and what they are; and the third perspective explains how the eight practices are different than other models for innovation.

a. What is Innovation and Adoption?

Thomas Edison has been known for saying that innovation boils down to 1% inspiration and 99% percent perspiration. This idea is fundamental to understanding how I look at innovation. Operationally, defining innovation and invention is key to understanding the difference between the two. Most people define innovation in terms of invention, invention being “the creation of new ideas, artifacts, processes, or methods” (Denning & Dunham, 2010, p. 6). Dunham and Denning (2010) defined innovation as “the adoption of a new practice in a community” (p. 6). Innovation is the act or process of getting an idea or invention accepted and widely used by a community, and is what the focus of effort has been for this research. Because people define and use the term innovation in the same manner as invention, the two words become synonymous with each other and this causes confusion when trying to understand the differences between the two terms. It is important to understand that innovation adoption is everything that takes place to enable an idea to go from a thought to delivering the final product, and then getting that product widely used within a community. Innovation adoption includes such activities as establishing processes and procedures, creating prototypes and testing, and all of the communications that is required to, identify the problem that needs to be fixed, articulating the benefits of the idea or technology, and sell the idea or technology to decision makers.

Innovation adoption is when a community agrees to widely adopt a technology or idea and put that technology or idea into long-term use all the while sustaining and maintaining the technology or idea over time. When a community agrees to adopt an innovation, they make three commitments: The first commitment is to agree to talk about the innovation, the second is to agree to initially try it for the first time, and the third is to commit to refining and maintaining it over time (Denning & Dunham,

2010). An idea, invention, or process improvement is doomed for failure if any of the three commitments are not met. Innovations have failed because there is no conversation about them. Someone in the organization sees or hears about an idea that will improve the bottom line, so they implement it. But because there was no conversation about the idea—why it should be adopted or the benefits it will bring—people who are caught off guard by the idea reject it. Failure to make a commitment to try something for the first time results in the idea, process, or method just sitting there until it is forgotten or passed over for the next idea. If there is no commitment to try something, there will not be any interest in seeing the potential that it could possibly bring. Because it is not going to be used, there will not be any follow through to make it an innovation and adopt the idea. If there is no commitment to refining and maintaining the innovation, it will not be sustained and will soon be replaced by the next innovation that may or may not bring about benefits to the organization. The community moves on to the next thing and does not maintain what has already been put in place (Denning & Dunham, 2010, p. 22).

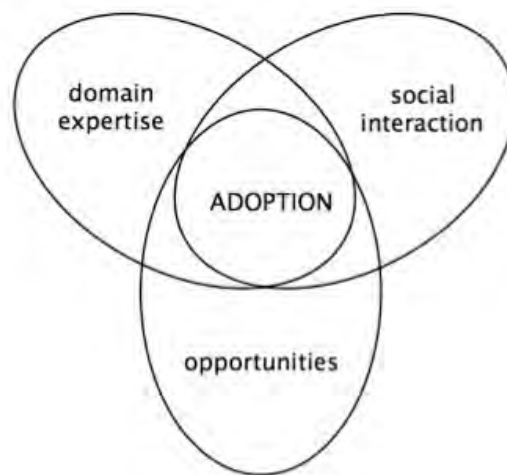


Figure 1. Adoption Domains
(From Dunning & Dunham, 2010, p. 23)

There are three domains of adoption. Figure 1 provides a view of these domains and how they interact to ultimately achieve adoption. Domain expertise is the first domain for adoption, and is how much time, knowledge, and experience someone

has within the area that they are working in. Low domain expertise results in the low probability of successful adoption of an innovation because decision makers will not trust what the person who lacks expertise is recommending. Social interaction is the second domain for adoption, and is the way in which people interact with each other—the conversations that occur between individuals and groups of individuals. Social interaction is being able to sell the story so that others will agree with a particular way of thinking and being able to sell that story in a clear, concise, and easily understood manner. Social interaction is both verbal and nonverbal in nature and is quite possibly the most difficult of the three domains to master. An innovator can be very proficient in the expertise domain, but be very off-putting in nonverbal or verbal communications. This situation causes people who are receiving the innovator’s story to not listen to what he or she is saying. The innovator therefore misses out on the opportunity to sell his or her innovation to those who would be able to effect the innovation’s adoption.

The last domain for adoption is the opportunity domain, which is making or seizing opportunities to improve the current situation. Opportunities are available at every turn, but the key is to understand and seize those opportunities when they are available. Seizing the opportunity can be as simple as telling an employee “we need you to do X” or as difficult as trying to change the Department of Defense’s (DoD) acquisition practices. Opportunity has a time factor associated with it; it may not be the right time to introduce an innovation, so the innovator must wait, observe, and then provide the details when the opportunity is right.

b. Eight Practices of Innovation Adoption

In order to be proficient in the three domains of adoption, there are eight practices that must be learned, understood, and mastered by those that desire to become more proficient at innovation adoption. Figure 2 provides a graphical display of the eight practices and how they each rely on the others in order to achieve ultimate success in each of the adoption domains. The eight practices are universal, nonsequential, and with every time the practice is used, the innovator becomes more proficient in the eight practices use. Proficiency within the use of each of the practices by the innovator is

achieved through learning. Every time the innovator has an unsuccessful attempt in employing one of the practices, they have an opportunity to learn how to do it better the next time. Each of the eight practices can be performed by an individual through a process, or just by doing the practice on its own right. The practices are as follows: *sensing* is having a gut feeling or a state of unrest about something and identifying what needs to be changed from the current state; *envisioning* is developing a plan of action to better the situation; *offering* is providing an idea to others; *adopting*, as stated earlier, is the process of convincing a community to put into practice an idea or invention; *sustaining* is maintaining an innovation after it has been widely adopted; *executing* is the practice of following through on a commitment that the innovator has made to another individual or group; *executing* is also putting in motion the vision that was developed earlier by the innovator; *leading* is the art of guiding people, convincing them to do things that they may not want to do; Finally, *embodying* is developing the eight practices so precisely that they become second nature. An example of embodiment is riding a bicycle. A person can be told how to do it, but he does not really know how to ride a bike until he has done it himself. Subsequently, he cannot explain all of the subtle factors that are involved with riding a bike.



Figure 2. Summary of the Eight Practices

(From Denning & Dunham, 2010, p. 32)

c. How the Eight Practices are Different

The major difference between the eight practices and other models for innovation is that they are intended to “improve innovation success by developing the right skills at both the personal and organizational levels” (Denning & Dunham, 2010, p. xix). The other benefit to the eight practices over other models is that they are measurable, repeatable, and trainable. An individual can learn to improve his proficiency in a practice, given time, and can learn to incorporate the practice into their daily activities, making them more productive and more capable of obtaining success in innovation adoption. As a way to identify areas for improvement in innovation adoption for the individual innovator, the eight practices can be used to identify what things an individual is doing well and what things they are not doing well, or possible not at all. Once the practice is identified as not being done, the individual can look for ways to implement that practice in order to improve their innovation adoption practices.

2. Marine Corps Systems Command

Marine Corps Systems Command (MARCORSYSCOM) was selected as the sample population for this research due to the fact that it is the acquisitions arm for the United States Marine Corps (USMC), and it was assumed that MARCORSYSCOM was utilizing the eight practices in some form for the adoption of innovation within the USMC. Additionally, utilizing MARCORSYSCOM allowed for the establishment of a baseline to compare future research against.

a. MARCORSYSCOM History

MARCORSYSCOM was established on January 13, 1992. Prior to this date, MARCORSYSCOM was known as Marine Corps Research, Development and Acquisition Command (MCRDAC), which was comprised of elements of Headquarters, Marine Corps, and Marine Corps Development and Education Command. The transition from MCRDAC to a systems command was a natural progression and the result of the Packard Commission, the Goldwater Nichols Act of 1986, and the DoD 5000. (MARCORSYSCOM, n.d.). MARCORSYSCOM is currently located in Quantico, VA, in a location referred to as “Hospital Point.”

b. MARCORSYSCOM Organization

MARCORSYSCOM has two reporting chains: One chain is for acquisitions matters and goes through the Assistant Secretary of the Navy for Research, Development, and Acquisitions, and the other chain is for Marine Corps matters and goes through the Commandant of the Marine Corps via the Assistant Commandant of the Marine Corps (MARCORSYSCOM, n.d.).

Composed of four major subcomponents, MARCORSYSCOM consists of the Command Staff, which encompasses the Chief Management Office, the Chief of Staff, and the Executive Director and is responsible for leadership functions within the Command. The second subcomponent consists of the Product Groups (PGs), which are responsible for the management of acquisition programs and projects in various stages of maturity within the acquisition cycle. There are eight PGs: PG 09—Operational Forces Systems; PG 10—Weapons and Sensors Development and Integration; PG 12—Communications, Intelligence, and Networking Systems; PG 13—Infantry Weapons Systems; PG 14—Armor and Fire Support Systems; PG 15—Ground Transportation and Engineer Systems; and PG 16—Combat Equipment and Support Systems. The third subcomponent consists of the independent PMs, who focus on special programs, projects that do not require the same management approach that is provided by the PGs, and projects that are very important to the Marine Corps. The last subcomponent is the professional staff. The professional staff is made up of “various Deputy Commanders and Assistant Commanders who support integration functions and competency support for the overall acquisition effort” (MARCORSYSCOM, n.d.).

c. MARCORSYSCOM’s Approach to USMC Acquisitions

As part of the DoD, MARCORSYSCOM is governed by the Defense Acquisition System and follows the laws and exacting business processes set forth by governing agencies such as the Joint Requirements Oversight Council (JROC), the DoD, and Congress. All military systems that MARCORSYSCOM acquires are based on a

concept or a requirement that has been vetted and justified; MARCORSYSCOM leadership does not base acquisitions on the identification of a capability gap (MARCORSYSCOM, n.d.).

C. BENEFITS OF THE STUDY

There are several benefits from this study, some of which are: providing a better understanding on how to identify gaps within current organizational and individual processes to better enable innovation adoption, a clear understanding of the factors that are barriers to innovation adoption at MARCORSYSCOM, and some ideas to consider when structuring an organization for innovation adoption. On this last point, this study suggests that the Marine Corps should be organized as an ambidextrous organization grounded in both the exploration and exploitation domains, and establishes starting points for future research on how this ambidextrous organization can be improved. Additionally, this study adds to the body of knowledge about how the eight practices for innovation adoption are applied to a government organization.

D. ORGANIZATION OF THIS STUDY

This study is focused on the issue of defining the eight practices as a framework for innovation adoption in the Marine Corps and on answering the following research question: How does *The Innovator's Way* apply to innovation adoption within the Marine Corps? Chapter II provides information on the empirical study that was conducted, the methodology used, and the metrics used as a result of the interviews that were conducted. Chapter II also provides a clear picture of the findings that came as a result of the interviews with MARCORSYSCOM PMs.

Chapter III provides information on how the individual practices and organizational theory result in a methodology for using the eight practices in the Marine Corps.

Chapter IV examines how to implement the eight practices in the Marine Corps and identifies some potential breakdowns that could occur as well as some recommendations on how to use the eight practices to achieve success in the adoption of innovation within the Marine Corps.

Chapter V provides conclusions from the research as well as limitations, recommendations, and potential for future research.

CHAPTER II

A. RESEARCH METHODOLOGY

The methodology used for the empirical part of this research was an experimental design using a combination of a “think aloud” protocol and structured interview. It follows the same approach as used by Dew, Read, Saravathy, and Wiltbank (2008) who demonstrated in their research on the differences between expert and novice entrepreneurs how the use of “think aloud protocols” (p. 8) provided for better results over the use of other protocol methodologies. This is because “subjects are required to think aloud continuously as they solve problems” (Dew et al., 2008, p. 8), allowing the researcher to examine what they are thinking right then and there. Their research conducted on entrepreneurs followed an experimental design in which an imaginary product called “Venturing” was introduced to the participants of the study. After the participants were introduced to the product, they were asked to think out loud while answering questions about how they would go about establishing an initial market for this new product. The research between novice and expert entrepreneurs provided empirical data on what experts versus novices do to bring a product to market initially and established a baseline on what should and should not be taught to future entrepreneurs currently enrolled in Master of Business Administration programs.

Saravhthy, Simon, and Lave (1998) used a quasi-experimental design in their research about the differences between bankers and entrepreneurs and how they deal with risk. All of the subjects of their research were provided the same questions and required to answers those questions using think-out-loud protocols. The results of their research were that “entrepreneurs accept risk as given and focus on controlling outcomes at any given level of risk; they also frame their problem spaces with personal values and consequently assume greater personal responsibility for influencing outcomes” (Sarasvathy et al., 1998, p. 217), but bankers “use target outcomes as reference points and operate by attempting to control risk within the existing structured problem spaces, avoiding situations where they risk higher levels of personal responsibility” (Saravhthy et al., 1998, p. 218).

In my study, all participants were provided the same standard stimulus which was a PowerPoint slide with one minute of audio. At the end of viewing the one-minute stimulus, participants were asked the same question and then asked to think out loud as they answered how they would go about getting the innovation adopted into the Marine Corps or elsewhere within the DoD. The structured interview portion of the research methodology consisted of an interview in which the participant was asked basic demographic information as well as specific questions on how the individual participant would go about performing specific practices. The structured interview and the experimental design were developed to be completed within one hour. In addition to a standard stimulus, each participant was provided with paper to write on and a writing instrument (pen or pencil) and within every interview space there was a white board and dry erase markers to write with.

B. SAMPLE POPULATION

1. Selection

PMs from MARCORSYSCOM were selected as the sample population for this research because they are the acquisitions arm for the USMC, and it was assumed that the PMs would be utilizing the eight practices in some form for the acquisitions of systems for the USMC. When considering PMs at MARCORSYSCOM as the sample consideration was given to the types of innovations (low-risk vs. radical), and it was decided that regardless of the type of innovation being adopted, there should be some part of the eight practices being used. Additionally, utilizing MARCORSYSCOM allowed for a baseline to then address future research against.

2. Description of Population

The average age of the person interviewed was 47.93 years old, with the low being 30 years and the high being 65 years. The average length of time each person spent in a project management role was 10.43 years, with the low being one year and the high being 31 years. Of the 16 interviewees, one had a high school diploma, six had bachelor of science degrees, two had master of business administration degrees, and seven had master of science degrees. The average number of program management projects that the

interviewees worked on, or in, was 13.25, with the low being one and the high being 55. All persons interviewed had taken courses related to project management and acquisitions and other basic DoD-mandated courses and received certificates from the Defense Acquisition University.

C. INTERVIEW TOOL

1. Video Recording

Video recording was used to capture the interview both audiologically and visually. This was done for two reasons. The first was to ensure that the words of the interviewees were captured accurately and the second was to test for innovation practice eight, embodiment. Embodiment of the other practices is centered around the nonverbals used in communicating. Examples of this would be a person drawing a picture to explain a difficult concept, or a person using his or her hands to emphasize an important point he or she is trying to make.


Ambady and Rosenthal (1993) in their research took video clips of different teachers teaching a period of instruction to the same group of students over the course of a semester. At the end of the semester, the students provided an evaluation of the teacher. Upon completion of the semester, Ambady and Rosenthal (1993) took the videos that they had recorded previously within their research, and created 30-second video clips which had no sound. They then showed the video clips to two groups of people, a group of judges and a group of students. Both groups that analyzed the video clips had no knowledge of the results of the teacher's evaluations conducted by the students who received the period of instruction, and neither group had any formal training on reading body language. Both groups were able to accurately predict what type of evaluation the teacher received from his or her students based on the facial expressions and body movements seen during the 30-second video clips. The use of thin slices was also used by Jung, Chong, and Leifer (2000), in their study of pair programming, and concluded that the act of "thin-slicing refers to the process of making accurate classifications based on small samples" and that "only a small interaction sample is necessary to make meaningful judgments about behavior occurring over longer durations" (p. 2).

As part of the experimental design for this research, video recording of the interviews was done for two reasons: One, to ensure that the words spoken during the interview were accurately captured, and two, by using the thin-slicing technique, evaluation of the body language of the interviewee can be done to test for the practice of embodiment. After examining the content of the interviews, the proposed thin-slicing portion of the study was dropped.


2. Structure of the Interview

I chose to develop a set of interview questions that were centered on the eight practices. Each of the questions was framed to elicit a response that would provide some insight as to how the person being interviewed implemented or thought about how to implement each of the eight practices. There were 16 questions in total and the interview was designed to last one hour. The first seven questions were basic demographic questions such as current age, length of time in the participant's current role, and education level or education specific to project management. The interviewee was then provided with a slide (see Figure 3) that had an image of a noise-canceling headset on it with some information about the headphone invention. The slide had a one-minute audio clip embedded in it that talked about what the invention was and what capabilities it provided to the user. We designed this question to be a constant stimulus to all being interviewed and to provide a standard departure for answering the questions that followed. Each of the remaining questions were focused on seven of the eight practices (sensing, envisioning, offering, adopting, sustaining, executing, and leading) and were designed to achieve a response that would provide a method to map the answer to the way the practice would be implemented or used by the interviewee in general.


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- Flexible connection to numerous radios
- Standard Junction box (wired) PTT or choice of wireless PTT's
- Earpiece requires custom mold for each user ear



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Figure 3. Interview Stimulus

Interview participants from MARCORSYSCOM were read questions from an interview script. The Institutional Review Board at the Naval Postgraduate School approved the script (see Appendix A) that was read to each participant to ensure that the same protocol was used with each interviewee.

The interview question that followed the invention outlined in Figure 3 was the following: How would you go about getting this innovation adopted in the Marine Corps or elsewhere in the DoD? The results were interesting and ranged from “push it out to the fleet and have the Commanders put in an Operational Needs Statement (ONS)” (subject interview, April 16, 2011) to talk to the financial people, and if they agree that it is a good fit to the Marine Corps, do up the paperwork (subject interview, April 16, 2011). In most cases, the baseline comment made by the PM was that the headset had to have a valid requirement, have funding attached to the product, and meet a specified schedule. Once those baseline comments were made, what followed was a discussion about the procedures, and processes in place at MARCORSYSCOM and how they apply to the PM

in order to get something purchased for the Marine Corps. Specific areas of discussion were: How a user evaluation is to be conducted, the importance of interoperability checks between the product and existing systems, the benefits and issues of the Information Assurance compliance process, and how to establish a time line to get the product to the end user. The answers provided by the interviewees varied so little between the more experienced and less experienced PMs that further analysis was not conducted. What was clear was that the answers provided followed along the lines of what would be required by the organization to get an innovation adopted, not what the individual would do to get an innovation adopted.

3. Interview Questions

The remaining questions in the interviews were based on the eight practices. I was interested in gaining information about the eight practices, so the questions were designed to solicit a response about them rather than about something else. The specific questions were as follows:

- Question 1 was based on the practice of sensing: In general, in your experience how do you identify there is an opportunity for you to get an innovation implemented in the Marine Corps or elsewhere in the DoD?
- Question 2 was based on the practice of envisioning: How do you go about shaping an effective vision for an innovative project?
- Question 3 was based on the practice of offering: In your experience how do you go about offering up an innovation for adoption in the Marine Corps or the DoD?
- Question 4 was based on the practice of offering: When a new system that you have developed becomes available, how do you get the Marines or other people in the DoD to try it for the first time?
- Question 5 was based on the practice of adopting: How do you get an innovation to become permanently adopted in the Marine Corps or DoD?
- Question 6 was based on the practice of executing: In your experience, how do you create an effective environment for executing an innovative project (i.e., how do you deliver the promise)?
- Question 7 was based on the practice of leading: In your experience, what leadership skills are involved in getting an innovation adopted?
- Question 8 was based on the practice of leading and being able to identify breakdowns and take appropriate action to overcome those breakdowns:

Based on your experience, what are the most characteristic breakdowns that cause innovations to fail to be adopted?

Embodying is the eighth practice and the interviewees were not asked questions based on this practice because embodiment happens as a result of the constant refinement of the other seven practices. Embodying is knowing what to do but not necessarily knowing how to explain it to others, like riding a bike.

D. CODING

Audio transcripts that were recorded as part of the video interviews were converted to text transcripts for each of the interview sessions. I conducted the coding of the answers provided by the interviewees where I looked for high-level mappings between seven of the eight practices and for how the interviewee utilized them to accomplish his or her duties as a program manager. Answers were then coded on a scale of 1 to 9 based on the words used to answer the question. A score of 1 meant the answer had a low correlation to a given practice; a score of 9 meant the answer had a high correlation to a given practice. Once all of the coding was complete, comparisons to seven of the eight practices were made. I was not provided with any specialized training on how to conduct the coding, or how to interpret the answers provided. The values that the coder associated to each of the answers was based on what he knew about the eight practices from reading the book *The Innovator's Way* and from participation in a class about idea adoption taught by Dr. Peter Denning at the Naval Postgraduate School.

E. RESULTS

To protect the identity of the individuals that were interviewed and to remain in compliance with the IRB, the names of the interviewees are withheld from this report as well as any identifying remarks that could connect the person being interviewed and his or her answer. In general, most of the questions resulted in answers that were focused on having a valid requirement, having a workable schedule, and having appropriate funding. Most interviewees did not look at innovation as a process of getting something adopted, but as an item that could be put in place that would cause a significant improvement to the current environment, improve a system being developed, or improve performance of a

process. The majority responded that innovation was something that was done somewhere else—such as at the Office of Naval Research (ONR), at the Defense Advanced Research Projects Agency (DARPA), or at the Marine Corps Warfighting Lab (MCWL)—and then provided to them in the form of a requirements document.

1. Detailed Answers by Question

Tables 1–8 provide a sample of the answers given by some of the MARCORSYSCOM PMs interviewed April 11–15, 2011. It is important to point out that during the coding process, there was a lot of interpretation that had to be done between what the interviewee said and how it mapped to each of the practices being asked about. The answers that I chose to include in the tables represent typical answers provided by the typical interviewee. The exact words may not have been used by every interviewee, but overall the general responses were similar between interviewees. As mentioned previously, the majority of the responses were grounded in how the organization completes a practice, not in how the individual would complete a practice. More specifically, most answers explained the process that are used at MARCORSYSCOM to accomplish the practice asked about.

a. Sensing

Table 1 provides sample responses to the interview question asked about the practice of sensing. The interview question related to this practice was designed to elicit responses relating to sensing an opportunity for getting an innovation adopted. A typical answer that would be expected based on what is found in *The Innovators Way* would be something similar to the following: “there is an opportunity to get an innovation adopted when a gap in the current process is realized”; “I get an uneasy feeling that there is something wrong with the current way business is being conducted and something needs to change—I just don’t know what it is right now”; or “I have a system in place where new ideas are recommended to me and then I scrub those submissions to establish what has a valid potential and what does not, and then pursue those that seem to have valid potential.”

Interviewee responses were quite different from these types of responses. Instead, interviewees focused on the latter part of the question that dealt with implementing an innovation into the Marine Corps or elsewhere in the DoD. The answers provided in Table 1 address the processes and procedures used at MARCORSYSCOM to implement a new technology and the difficulties that PMs have with trying to implement a new technology. Because the responses focused more on implementing a technology and not on sensing an opportunity to implement an innovation, mapping to the practice of sensing was low and, as a result, the correlation to how the PM understood the practice was low. What I understood as a result of the interviews was that at the organizational level there exists several ways for PMs within MARCORSYSCOM to identify new and potential ideas. As a method of sensing possible new ideas and technologies within the organization of MARCORSYSCOM, methods such as an Urgent Needs Statement (UNS), Operational Needs Statement (ONS), feedback from operational units, and technology and industry days were mentioned.

Table 1. Question 1 Response Samples

Question One Responses
That is a tough because our statutes and regulations, that is just very difficult. I hate to say this. I just don't go there.
It needs to be looked at in the context of the planning and programming and budgeting process.
From my experience, again, it's been urgent driven—urgent needs driven—so that would be the writing on the wall for me.
I see that as being somewhat challenging. We have hurdles in our way, barriers to innovation even though we try to promote it as much as we can. We are still a fairly risk adverse culture.
I can introduce that to Marines somewhere out in the fleet and say, "here is this great idea. I want you to take a couple and work with it and see if it does any good. If it does, you need to start the requirement process and come back up through the chain of command and say we need this."
It depends on what the requirement is. If it is innovative a lot of time it is a technology that is, you know, you talk about technology readiness level.
There is a formal process that they identify that to the Marine Corps and it comes in and then goes before a board that review that.
Well I think primarily it is kind of your individual initiative and if you see an opportunity for a better mousetrap then you are kind of on your own initiative to kind of push that through.

b. Envisioning

Question 2 was framed to elicit a response centered on how the PM would create an effective vision about an innovation. Denning “Envisioning practice is all about good storytelling” (Denning & Dunham, 2010, p. 141). A typical response that I was trying to generate from the interviewee would have been something that provides the listener with a clear understanding of the end state the innovation is going to have, what benefits are by adoption the innovation, why the innovation is necessary.

The answers that interviewees provided, however, were centered on implementation methods at MARCORSYSCOM, team building practices, the requirements process, and asking Marines if what the PM is doing is the right thing as seen in the Table 2 sample responses. One interviewee stated that there currently is no

process for developing a vision, and a second stated that he is not in the business of shaping a vision. These two responses were particularly interesting because they demonstrate that the PM thinks that there is a need for a process in order for action to be taken and that if an idea is not directly tied to a requirement, it will not be considered.

Table 2. Question 2 Response Samples

Question Two Responses
We want to do what is tried and true because we don't want to waste time, money and effort because our resources are so limited and if you go off and do something innovative you are going to screw us up.
We should really look at what it is we really need, okay, and what is the minimum that we need to do here to ensure that we will deliver an effective capability.
I guess the best way is to go back to the requirements folks and getting the buy in from all the various organizations and entities that SYSCOM has to deal with.
You have got to really need to understand your stakeholders, and you have to have developed strong, good relationships with your stakeholders.
I bring all the people from all the different categories [engineering, finance, contracting] and say, "hey, here is my idea. How can we make this work?"
I go back to what the user requires and I generally don't try to propose innovations because that's me looking at the user and saying, "Okay I think you need this." It is better for them to come to me and say, "I need this."
Aggressive advertising when we are out at the different Marine shows encouraging Marines, "hey, what do you think? What are your ideas? What have you seen out there?"
Well I don't—the kind of theme is that there is no good way to do it. There isn't a process for it that I am aware of.

c. Offering

Question 3 was designed to elicit an answer about how the PM would go about offering up an innovation for adoption in to the Marine Corps. Denning and Dunham (2010) explain that “an offer is not an event; it is a process. Offers evolve over time in conversations with many people” (p. 174). What this means is that innovations are subject to ridicule, rejection, and scrutiny. If the innovator stops the first time the innovation is rejected, then the innovation will never become adopted (Denning &

Dunham, 2010). The typical answer that I was looking from interviewees about this concept would have discussed how the PM would introduce the innovation in spite of the innovation being rejected.

The answers given were different. They centered on the fact that most PMs thought that coming up with new innovations was the responsibility of some other organization. They also stated that there needed to be a valid requirement in order for the innovation to be considered. What the answers provided suggest is that as long as an innovation meets a requirement, it will be put into production regardless of the benefit, or lack thereof.

Table 3. Question 3 Response Samples

Question Three Responses
You go straight to the top within bounds of reality and you have your ducks in a row.
In terms of pure innovation, you know, we are not a software company, you know. We are not a start up. We are not trying to build the next iPod. Our requirements come from the warfighter.
I hate to say this, but maybe working at somewhere like the MCWL. I mean, that's really where it should be coming from.
It boils down to those requirements again. The requirements process. Somebody in the fleet has to decide who needs something.
Whenever there is a new piece of equipment we have a fielding plan.
You get these new ideas in and you could write an info paper. You have to identify who the stakeholders are.
I'm not sure that really applies to the IT realm. Any software that we do has been around for a long time. The innovations in that are just do we interface and most of that is not that hard.
Our primary mechanism is what we call a FUE or a field user evaluation which we can conduct at the program manager level.

d. Adopting

The practice of adopting is making the commitment to consider the innovation, try the innovation for the first time, and then to sustain it over time (Denning & Dunham 2010). The typical answer that I was expecting would be something along the lines of identifying a communications process between the PM and the decision makers and the community of interest that the innovation is to be adopted into.

The answers provided by the interviewees centered on the processes and rules found in the acquisition cycle, and how those processes are used within the organization for the practice of adopting. PMs sample answers are provided in Table 4 and explain that at different stages within the acquisitions cycle, prototypes, finished products, and simulations are put in front of Marines to test. As part of the acquisitions cycle, feedback is provided to the PM, and the test results are used to improve the product. At some point the product is passed off to the end user for sustaining the product for the long term. One breakdown that appears to occur in the practice of adopting is that the end user or the PM is not part of the commitment made to adopt the innovation; instead, they are told what to do, or because it is mandated from higher levels, forced to adopt the innovation even though the PM or end user does not realize any benefit from adopting the innovation.

Table 4. Question 4 Response Samples

Question Four Responses
Most of the time you have to tell people what to do.
Again, I think that is largely something the warfighting lab does now. They experiment with tactics, techniques, procedures and equipment. They will—we are not in that business.
Having the fielding conference and making sure everybody is onboard with understanding the maintenance philosophy, how we're going to support the system, you know, what the shipping schedule is and having that reach back to MEF and making sure they understand where the training is coming from.
I take the opportunity at my program reviews to expose those things. But by taking the opportunity to outwardly basically sell what you are doing making sure everybody understands the unemotional value of that innovation or that technology.
We have processes in place here at SYSCOM that we have to follow. We have field user evaluations. We have limited user evaluations. So if I want Marines on something I have an evaluation process I have to go through.
The innovation piece is something that I don't focus on. I focus on what they requirements are, what they need and then how to meet that need.
We put a training team together and we sent them out to the MEFs to introduce the [new product]
Most of it is just mandating. I mean, it's not like we're going to go out there and convince you that this is a good thing. Unfortunately, most of ours are mandates from higher than us and they come down from the DoD level.

e. Sustaining

Denning and Dunham (2010) describe the practices of sustaining as “keeping the innovation relevant and useful after adoption—integrating and fitting the new practice into the environment of the community so that it can be continued easily” (Denning & Dunham, 2010, p. 203). The typical answer that I was expecting would be “products are reviewed on a yearly basis to ensure that they are still relevant,” or “to ensure that the product remains useful, I take customer feedback and use that feedback to improve the product to keep it up to date for the end user.”

The typical answers provided by the interviewees (as seen in the sample answers in Table 5) were centered on the organizational processes in place at MARCORSYSCOM and within the Marine Corps in order to make a product a program

of record (POR), or make the product part of the Marine Corps table of equipment (TOE). Additionally, some of the answers focused on creating new military occupational skills (MOS), and making the product fit into the tactics and procedures of the Marine Corps, which are both organizational practices that would be done by different Marine Corps organizations.

Table 5. Question 5 Response Samples

Question Five Responses
You have to make a rule.
The leadership in the Marine Corps has to endorse it through action at the MROC level.
Become organic or actually working with TCOM to amend our training plan and program and get the MOS assigned [to] this...
We have a formal operational testing or FUE event where that would be the first operational use where we will look at the operational effectiveness and suitability of the system.
It goes back to understanding the requirements. You have to have good communications flow with the user representative.
It has to get into our tactics, techniques and procedures. It has to be brought into our doctrine. In some cases, it's a policy issue.
The best way to do that would be if user buy-in when you're doing the requirements generation of your product.
It needs to get into a formal acquisition program. That is so all the less exciting things get done. Training manuals get updated, spares get procured, SL3 lists get updated to account for this new capability and then it is part of the programs formal baseline.

f. Executing

Denning and Dunham (2010) describe the practice of executing applying to more than just the final product being delivered. They suggest that executing is the final product of all of the other practices as well.

In innovation, execution refers to the actions that convert the possibility offered into a promise delivered. Execution is essential not only for the final outcome of the innovation process, but also for all the outcomes of the individual practices. Intermediate results, such as prototypes and demonstrations, build trust in the promise and its value through evidence. (p. 219)

The typical answer provided by interviewees on Question 6, and seen in the sample responses in Table 6, did not correlate well to the response that I expected. This may be because the question was created to elicit an individual response, or there may have been “confusion in the interviewees” minds as to how to provide an individual response in terms of how they individually experience executing an innovation. The PMs, as a way of answering the question, provided the processes in place at MARCORSYSCOM that are used to execute an acquisitions program. In general, however, I think that the requirements process and the acquisition cycle generates a promise between the PM and the end user that describes what the product will be in the end, what capabilities the product will be required to have, and building trust in the user community that the PM is listening to their needs. The PM builds trust with the end user by talking and listening to the end user to understand their requirements and needs. The PM also builds trust with the end user by providing prototypes, simulations, and feedback loops to address end user concerns; all of these actions are used by the PM to demonstrate that they are committed to delivering a promise.

Table 6. Question 6 Response Samples

Question Six Responses
If you want innovation from people you have to make yourself available as a leader.
Well I think you just have to know how the system works. I mean there are a lot of things that have to happen to really take an innovative concept and turn it into an executing acquisition program; building that strong foundation, having people understand how that works.
It has to meet the requirements. I can't stress that enough.
It has got to get associated with the program of record.
Again, we are so tied to processes here at SYSCOM. Not always great for innovative processes. If I want to take an innovation process and make it something that we are going to use time and again, it is well beyond my level, you have just got to keep presenting it, pushing it out.
I think communication and listening skills.
I think the key though is don't promise something you can't deliver.
It is really trying to include the user community all throughout the process of what we call the acquisition cycle.

g. Leading

Denning and Dunham (2010) describe the practice of leading as “the skill of initiating possibility and action with others through conversations that evoke their commitment to a new future” (p. 241). Leadership styles are as varied as are leaders. Each leader has his or her own way of motivating and getting those being lead to accomplish tasks. Denning and Dunham (2010) stated that there is a style that appears to be the best for innovation: “it is the style in which the leader initiates the movement and then gets out of the way of the followers so deftly that they think they did it themselves” (p. 241).

In general, I think that the answers provided by the interviewees were commensurate with what I expected to hear from them about leadership. A sample of their responses (Table 7), discussed knowing their people, understanding and working within their costs, and having effective communication between those who are implementing the innovation.

Table 7. Question 7 Response Samples

Question Seven Responses
Oral and written communications skills, network with people, leadership buy in, a positive regulatory environment.
The same stuff that we teach Marines, you know, that's the number one thing, and then being able to communicate well.
You need to stay proactive. Talking to the right people and keeping management well informed.
Will I would say your technical skills and your communication skills.
Well, you get the right people involved with it.
Manage to your cost, schedule and performance and your user requirements are your biggest things.
Communications is probably the key, and the ability to communicate up and down the chain and cross-laterally.
Perseverance is something that comes to mind right off the bat. [Innovation adoption] is more of an attrition warfare proposition and keeping at it.

h. Leading (Identifying Breakdowns)

An important part of leadership is being able to identify potential breakdowns and then overcome them. Question 8 was designed to elicit a response from the interviewee that would identify breakdowns in innovation adoption projects they had worked on in the past. In general, the PMs interviewed were able to identify breakdowns that occurred in projects they had worked on. The breakdowns that were identified by the PMs were similar to what has been seen in other research about organizational theory and barriers to innovation (discussed in Chapter IV), and they ranged from lack of communication between individuals implementing innovations to being so tied to a process that there was no way to break free from it. In general, I think that if put in a situation in which the PM had to overcome a barrier, he or she would be able to do so either through an existing process or through some other leadership method that they had experience with.

Table 8. Question 8 Response Samples

Question Eight Responses
They [GS 13-14] are not communicating what their subordinates are doing either up or down the chain of command.
I think the biggest thing probably is we really don't understand what it is we wanted in the first place. We didn't really tie it back to what the warfighter really needed.
Bad requirements. I have seen that a lot where we're following to a T what the requirement says, but it's really not going to answer the mail or the Marine.
Inability to understand and mitigate risk is number one. Again just overcoming the barrier of we have never done it that way before is very challenging or, "oh, our process doesn't support that."
I would say one of them is that people get so mired in the processes that sometimes they just give up.
If the user wanted something else ultimately they are not going to adopt it and so communication, understanding their requirements, being able to draw the requirements from what they want to what you are getting and I think those are the key things.
A long time line where people lose interest very quickly, they get distracted by something else.
The most obvious one is that it doesn't turn out to be as innovative as you thought or it doesn't perform as advertised.

2. Coding the Results

Because the answers to Questions 1–8 were coded on a scale of 1 to 9, the context of the question was analyzed in order to derive a score, and then a determination was made on how well each answer fit the conditions established in *The Innovator's Way* (Denning & Dunham, 2010). Appendix B provides a detailed list of how each of the interview questions were scored and how the overall score seen in Table 9 and 10 were derived. The answers to Question 1 shown in Table 1 illustrate how this coding method was accomplished. Question 1 asked, in general, in the PMs experience how do they identify there is an opportunity for them to get an innovation implemented in the Marine Corps or elsewhere in the DoD? An answer such as "that is tough because our statutes and regulations, that is just very difficult. I hate to say this, I just don't go there" (subject interview, April 16, 2011) would be scored with a low number, such as a 1 or 2, because

the practice of sensing doesn't appear to be implemented by the PM at all within that answer. A higher scoring answer would be "Well I think primarily it is kind of your individual initiative and if you see an opportunity for a better mousetrap then you are kind of on your own initiative to kind of push that through" (subject interview, April 16, 2011). This answer demonstrates an understanding of the need to identify a problem and then identify a possible solution that could solve the problem, and, as a result, this specific answer scored an 8. Once all 16 interviewee answers were coded in this manner and the average score was taken, a determination of how each of the eight practices were being used by the PM at MARCORSYSCOM was made. Table 9 provides the averaged results based on this coding scheme and the correlation to the eight practices on an individual level.

Table 9. Individual Results of Coding Interviews

Question	Result
Q1	2.37
Q2	4.81
Q3	4.88
Q4	4.69
Q5	4.81
Q6	5.31
Q7	6.50
Q8	7.25

The assumptions for the low scores for Questions 1–6 are based on a different way of looking at innovation. It is clear that everyone interviewed knows and understands how to identify a breakdown in an innovation adoption, and what leadership skills are required to get an innovation adopted. Additional reasons for the low scores could be that although the questions were designed to elicit an individual response, the answers provided addressed how the organization accomplished the practice.

Due to the low scores between the eight practices and how the individual PMs went about performing them, the answers provided by the interviewees were recoded analyzing the answers through an organizational lens. This recoding was done in order to

see if the answers provided by the interviewees would result in any mappings between the organization and the eight practices. Overall there was a slight increase in the scores for the eight practices when looking at the interviewees' answers through a lens of how the organization of MARCORSYSCOM accomplishes the eight practices.

The increases in numbers are explained by how the coding was done differently between looking at how the individual implements the practices, and how the organization implements the practice. For example, when coding for the practice of sustaining, if the answer was "it has to be put into doctrine," this would be what the organization does to implement a sustaining practice. In contrast to the coding done on individual mappings, where the answer provided would have scored a low number such as 3 or 4, from an organizational perspective, this answer could score much higher and be given a 7 or 8, because developing doctrine is a practice that the organization would be part of with another organization in order to enable long-term sustainment of the product. Table 10 provides the break out of the specific correlations.

Table 10. Organizational Results of Coding Interviews

Question	Result
Q1	5.81
Q2	5.56
Q3	6.00
Q4	6.44
Q5	6.38
Q6	6.31
Q7	7.19
Q8	7.75

Coding of the video and the use of thin slices was not used to make a determination of embodiment of the eight practices because it became clear that the answers provided by the interviewees were generally centered on how the organization accomplished the practice instead of the individual. Testing for the embodiment of the individual practice by each PM became moot.

F. CHAPTER SUMMARY

The results of this empirical study did not provide the variance that I was hoping to achieve in order to compare experienced and less experience PMs to determine if they implemented any of the eight practices identified by Denning and Dunham (2010) on an individual basis. Some possible reasons for the low variance in answers provided by PMs could be MARCORSYSCOM's approach to acquisitions, which is closely tied to rules, regulations, and the fact that products and systems procured are not based on gap analysis within the Marine Corps but through vetted and justified requirements process. The results of the interviews and the experimental design moved this research from the view of trying to understand how an individual uses the eight practices to how an organization uses and implements the eight practices.

CHAPTER III

A. INNOVATION ADOPTION WITHIN ORGANIZATIONS

The major finding of Chapter II is that the people interviewed provided answers relating to how organizational practices, rules and procedures were used for innovation, and not how the PM performed the eight practices individually. The fact that the interviewees answered questions based on the processes, rules, and procedures used at MARCORSYSCOM demonstrates that the PMs are tied to a role they are assigned to within the organization and that that organization is to accomplish a specific task. This also suggests that MARCORSYSCOM as an organization goes about innovation adoption irrespective of the people within MARCORSYSCOM.

Therefore, in order to understand how organizations adopt innovations, it is important to understand how the eight practices apply to an organization, and what tradeoffs organizations are required to make when attempting innovation adoption.

1. Eight Practices within Organizations

In *The Innovator's Way*, it is suggested that the eight practices, although applied only to the individual within the book, are critical to how organizations accomplish innovation adoption as well. Figure 4 illustrates how the individual practices apply to an organization.



Figure 4. Eight Practices and Organizations

(From Denning & Dunham, 2010, p. 297)

Organization practices (rules, standard operating procedures [SOPs], guidelines, directives) allow employees within an organization to cultivate and improve their individual skills in the eight practices because the eight practices work together to protect the employee and provide them an environment that is accepting of innovation adoption practices. The employees then, as part of the organization, improve the actions of the organization by improving the processes, rules, and procedures and by making the organization a learning one. What this suggests is that to be an employee within an organization that uses the eight practices, the employee has a degree of freedom to do those activities that is required in order to adopt innovations. This is in line with the findings of Ferrer and Dew (2007). Ferrer and Dew (2007) made two important findings. The first is that the motivation that the employees get from their boss and co-workers enables the employee to try again in spite of failed attempts and very complicated processes. The second finding is that protection, or the appearance of protection, from those who are in authority over the employee provided a feeling of security to the employee. If the employee feels that he or she will be protected and not “thrown under the bus” for failing, then the employee will be more willing to try another risky project.

Innovations, and the process of adopting them, are stressful, demanding, and prone to failure. Individuals will produce more and become more willing to be innovative if their managers and co-workers properly motivate them, and if they have the feeling of being protected when they fail.

a. Organizational Application of Individual Practices

Dunning and Dunham (2010) suggested that the eight practices at the organizational level are different from the individual practices, and they offer a list of five reasons for this and is taken directly from their book:

1. Groups or teams perform the practices. The organization will be concerned with having effective teams, team leaders, and team members (Goleman, 2007; Hughes, 2007).
2. The organization provides coordination among groups so that the practices flow, align with organizational objectives, and meet deliverables (Malone, 2004).
3. The organization provides many eyes, ears, and minds to increase the space of possibilities in every practice. Toyota proactively solicited employee suggestions, receiving 200 suggestions per year per employee, and used them to attain strong market leadership.
4. The organization provides more resources to explore, develop, and execute in every practice.
5. New breakdowns appear at the organizational level that do not appear for individuals. Common areas of breakdown include the coherence of roles in the organization, who has what authority, and coordination for cross-organizational actions and changes. (p. 299)

One way of looking at the answers that were provided by PMs as part of the interviews that were conducted at MARCORSYSCOM is that they reveal something about how the eight practices are applied at an organizational level in that organization. As a method of offering, the PM would organize a team to create the vision for the product. The team would go through the rigor that is required to tell the story of all the benefits the invention would be able to produce. Additionally, the acquisitions cycle, and the development of it, is the process that is used for executing within MARCORSYSCOM. This close tie to the acquisitions cycle ensures that deliverables are

met. Another example of how MARCORSYSCOM goes about using some of the eight practices at an organizational level is the requirements development process. The requirements development process is used for several practices and such as developing new ideas (sensing), and talking to the user community in order to define what the product must be capable of doing (adopting, offering). Additionally, as discussed with PMs the acquisitions cycle is used at the organizational level within MARCORSYSCOM for the practice of executing.

Denning and Dunham (2010) describe that the breakdowns in innovation adoption that an organization are different than what an individual innovator may experience. Some examples of how breakdowns experienced by the organization are different than breakdowns experienced by the individual for the interviews that were conducted are: PMs identified that being tightly aligned to a process made it difficult to be innovative because the organization has a very ridged process in place to ensure everything was accounted for in order to meet mandates by rules, orders, and directives; Additionally, the PMs identified the hand off of the product at the end of the acquisitions cycle to the user community as problematic for innovation adoption, and that the friction that occurs when trying to coordinate between other departments within MARCORSYSCOM is often a barrier to innovation adoption.

b. Organizational Examples of the Eight Practices

Denning and Dunham (2010) provide two examples in *The Innovator's Way* of organizations and their use of the eight practices in order for innovation adoption to occur at the organizational level. The first organization is Google, and the second is the World Wide Web Consortium (W3C). Google is an entrepreneurial organization and W3C is a nonprofit organization. Tables 11 and 12 provide information on how these two companies implement the eight practices within their organizations.

Table 11. The Eight Practices in Google

(From Denning & Dunham, 2010, p. 302)

Practice	How Google Excels at Them
Sensing	Every engineer is required to spend 20% of time examining technical projects of their own choosing. Anyone in the company can submit suggestions to a company suggestion box, which is reviewed regularly.
Envisioning	Every engineer builds stories about how their new ideas contribute to the Google mission. Google blogs and representatives tell these stories wherever they go.
Offering	The design process stresses testing from the very beginning. Engineers set up alpha and beta tests for their new products as they are developing them. They can tell quickly if their offers of new products are going to succeed. They mount their test products, and get real customer response. They also use internal prediction markets to gauge the likely success of new products.
Adopting	Prototypes that do not attract sufficient customers are abandoned. Those that do already have a customer base when they transition to released products.
Sustaining	The practices themselves are fundamental to the culture, and the percentage of time policies for technical staff and management require sustaining actions. The sharing of the generous revenue streams and the high performance scalable infrastructure sustain the ecology.
Executing	The robust development environment, direct access to customers on the web, and a development process streamlined for fast internal test and customer response enable fast innovation. The strategies of data collection and automation ensure there is plenty of data for managers to assess the effectiveness of processes.
Leading	Google engineers are held accountable and are incented to be proactive about promoting and testing new ideas and gaining adherents to those ideas. Management is held accountable to bring new business ideas to fruition.
Embodying	The basic values and strategies of Google are embodied by the founders and senior leadership and imitated by everyone in the company. The practices and policies of the company produce recurrent engagement and skill in its innovation-producing processes.

Table 12. The Eight Practices in the World Wide Web Consortium

(From Denning & Dunham, 2010, p. 304)

Practice	How W3C Excels at Them
Sensing	All members are encouraged to submit new ideas for consideration as W3C standards or software.
Envisioning	Proposers of new ideas must write compelling narratives about the value of the new idea being implemented as a standard.
Offering	A review committee that polls the membership and selects proposals for which there is sufficient support.
Adopting	Task forces of representatives from many member organizations are established for each accepted proposal. They design and test a detailed draft standard. They use W3C programmers to help build prototypes of software tools. Their drafts are submitted to the membership, for comments and later for votes. It becomes a "W3C recommendation" on receiving a strong vote. W3C recommendations become de facto standards since all the players agreed to use them.
Sustaining	All W3C recommendations and software are maintained on the W3C web site. New versions issued as needed after periodic reviews.
Executing	The processes used for task forces and voting are spelled out in the W3C rules and procedures and are applied uniformly for all projects.
Leading	Individuals and small groups who advocate that the W3C take on a project must work proactively to gain support for the project and to articulate its value so that it will ultimately receive a positive vote.
Embodying	Tim Berners-Lee, the consortium manager, and his senior leaders embody the basic principles of the Web: openness, inclusiveness, no private control of any Web technology, channeling development toward improving the Web as an information-sharing medium.

The point to these two examples (W3C and Google) from the book is to illustrate how the organization has adopted the eight practices as a method for innovation adoption. The employees are encouraged to look for new innovations, are protected when they fail at producing an innovation that will bring about a return that positively affects the organization's bottom line, and are encouraged to try again. In the Google example, Denning and Dunham (2010) identify that prototypes of the ideas generated by Google's engineers are created as a method for offering and adopting, and those prototypes that do not make the cut are simply pushed aside so that other work can be produced. There is no negative impact brought to the team that produced the prototype if it fails to make the cut; the team is simply encouraged to try another innovation. In the W3C example provided by Denning and Dunham (2010), prototypes and software are proposed in draft format. If the draft standard receives the required votes needed to become an official standard, it is

implemented by the W3C for everyone to follow. If the draft standard fails to get the required votes, it is reworked to make it more compelling or abandoned for a more agreeable standard.

Google and W3C are for-profit and nonprofit organizations, but how does a Marine Corps organization implement the eight practices and how does it become proficient at innovation adoption? A Marine Corps organization is neither a for-profit nor a nonprofit organization and is often driven by strict rules, procedures, and standards for the Marine Corps organization's day-to-day accomplishments. I examine this issue next.

2. The Purpose of an Organization

Allison and Zelikow (1999) addressed how government organizations form and act and what results they are expected to provide. They wrote that “to perform complex tasks, the behavior of individuals must be coordinated” (Chapter 3). They further stated,

At any given time, a government consists of existing organizations, each with a fixed set of standard operating procedures and programs. The behavior of these organizations—and consequently of the government—relevant to an issue in any particular instance is, therefore, determined primarily by routines established prior to that instance. (Chapter 3)

Routines and SOPs within an organization are created to shape individuals into a specific role that the organization requires in order to accomplish its mission regardless of who is sitting in the job. An example of an organization that created roles for individuals to fill is the Marine Rifle Squad. The Marine Rifle Squad's mission is to “close with and destroy the enemy by fire and maneuver.” In order to accomplish this mission, each squad develops a set of SOPs that define the role that everyone within the squad is responsible for accomplishing. Everyone within the squad knows and understands his or her role and his or her responsibility to the other members of the squad. Due to these specified roles and routines within the squad, the person filling the role or accomplishing the routine becomes transparent in order for the squad to be more efficient. Allison and Zelikow (1999) agree and say that “set programs and rigid routines are easy to criticize, yet they are indispensable to efficient organization” (Chapter 3).

a. Routines in Organization

Rigid routines and programs make an organization more efficient at accomplishing the task that the organization is designed to accomplish, but they do little to accomplish tasks that are not identified in the SOP or that are not routine. Take, for example, a fast food company. As part of their organization they have guidelines, practices, and SOPs for everything from how long the food should be cooked to how it should be seasoned and so on. These rules and procedures allow them to deliver their product in spite of a high turnover rate of employees. They are very good at producing the same product over and over again at an efficient rate with little waste. However, when a customer comes in and wants something that is not the norm, the customer tends to wait longer for that “special order,” or they are provided with something that is not what they ordered. The reason a person does not get what they ordered is because it is not in the routine; there is no protocol to cover how to do make the special order and, in some cases, it cannot be provided at all. Innovation, and the adoption of it, is not key to their success and, therefore, innovation appears to be stifled within the organization.

In the fast food example, the organization experiences a tradeoff between exploration and exploitation. Exploration being defined as those activities that parallel flexibility, agility, risk-taking and exploitation being defined as those activities associated with production, efficiency, and low-risk. March (1991) spoke of the tradeoff between the exploration domain and the exploitation domain, and those organizations that go too far to one side of the spectrum will not reap the benefits of the other side. Figure 5 provides a graphical depiction of the tradeoff that occurs between exploration and exploitation.

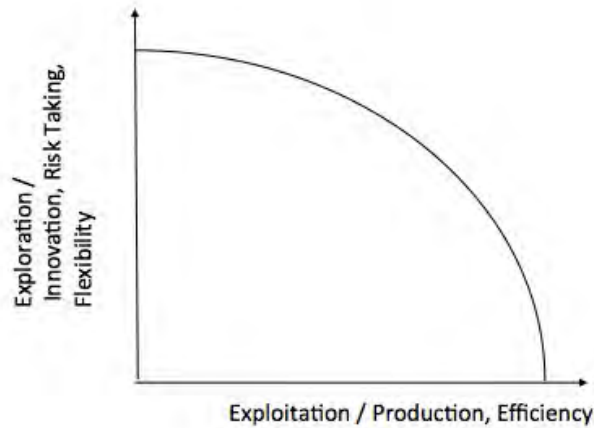


Figure 5. Tradeoff between Exploration and Exploitation

One output from the interviews I conducted at MARCORSYSCOM was that it was experiencing the tradeoff between innovation, flexibility, and risk taking in contrast to efficiency, production, and rigid adherence to processes. As an organization, MARCORSYSCOM appears to have migrated more toward the exploitation domain and to have focused on efficiency, on the production of its products, and on routines within the organization. This focus appears to limit MARCORSYSCOM's ability to be innovative and to take large-scale risks. An example of an organization on the other side of the spectrum from MARCORSYSCOM is the Marine Corps Warfighting Lab (MCWL). MCWL was established in 1995 to develop solutions for the warfighter through innovation and experimentation (United States Marine Corps, n.d.). MCWL appears to be more in line with the exploration domain because it is good at finding new innovations that will help the warfighter. Some innovations MCWL has pursued are lighter weight body armor and load bearing equipment devices as a way to lighten the load for the Marine has to carry, alternative energy sources such as deployable solar panels, and robotic aircraft for resupply. MCWL, however, appears to not be as good at the exploitation domain, specifically at production, procurement, and sustainment. I make this statement based on comments made by interviewees, such as "MCWL finds the innovation and then hands it off to us [MARCORSYSCOM] for procurement and sustainment" (subject interview, April 16, 2011). The same tradeoff

experience can be seen within Google. As discussed previously, Google is a highly innovative organization. It is flexible and exploration oriented, but due to that, it has issues with efficiency. An example of Google's inefficiency issues is its production of prototypes that may or may not result in a marketable product in the end. This may be highly inefficient because dollars, time, and other resources are spent on prototypes that may or may not have a positive effect on the financial portfolio of Google. The bottom line to innovation adoption is that it needs to be a blend of exploration and exploitation so that one domain does not suffer at the expense of the other.

b. Differences between the Views on Organization

The views between how Denning and Dunham (2010) see the eight practices being used and implemented within an organization and how Allison and Zelikow (1999) describe how an organization uses an individual appear to be at odds. Denning and Dunham (2010) suggested that the individuals within the organization influence the organization's accomplishments; Allison and Zelikow (1999) suggested that the organizations create roles for individuals to fill in order to accomplish the mission of the organization, regardless of the individual who is actually sitting in the seat. Additionally, Denning and Dunham lean more toward the exploration domain and Allison and Zelikow lean more toward exploitation.

An additional difference between these two organizational views is how they perceive failure. Denning and Dunham (2010) suggested that failing is part of learning and a fundamental requirement to getting an innovation adopted. Denning and Dunham (2010) further suggested that part of implementing the eight practices is to provide a notion of safety to those who are participating in innovation adoption. By doing this, employees are more willing to try another innovation if they are being motivated, protected, and encouraged by their leadership and coworkers. In contrast, Allison and Zelikow (1999) suggested that an employee is assigned to a role within the organization in order to prevent failure; that employee overcomes the pending failure in order to make it possible for the organization to accomplish its task.

c. Organizational Views and the Marine Corps

After 16 years of service as a Marine Corps officer, it appears to me that the majority of Marine Corps organizations are grounded in the exploitation domain. Marine Corps organizations are formed to complete a specific task and generally perform in the manner described by Allison and Zielkow (1999). Marine Corps organizations establish SOPs, orders, and directives to ensure that the organization will be able to accomplish the task it is designed to accomplish regardless of the performance of individual Marines within the organization. Because Marine Corps organizations are more closely associated with the exploitation domain, the tradeoff that occurs within the organization occurs between agility and efficiency, high-risk initiatives and low risk initiatives, and unknown solutions and existing solutions. By choosing to be closely tied to the exploitation domain, innovation adoption is problematic. Which side of the exploration–exploitation tradeoff spectrum is picked depends on the situation. A Marine Corps organization could pick solutions that are more closely related to the exploration spectrum while conducting training, but when it comes to day-to-day routines, the organization might pick initiatives more closely aligned toward the exploitation domain.

An example of the tradeoff that occurs within the Marine Corps between the exploration and the exploitation domain is how the failure of a second lieutenant is handled within the training environment (highly explorative) and a combat environment (highly exploitative). A brand new second lieutenant right out of The Basic School understands that the training environment is where they test new ideas to problem solve and that in combat the plan has to be followed because the actions they are required to preform have an effect on another unit. In a training environment, the second lieutenant is allowed to make mistakes, and it is commonly understood within the Marine Corps that new lieutenants will make mistakes in training when they first enter the Fleet Marine Force (FMF). The culture of the Marine Corps expects that this is part of the learning that occurs for the lieutenant and that making mistakes will make them better able to handle real-life situations. Within a training environment, failures that occur that do not result in the loss of life, limb, or equipment are generally used as learning points. In the example

of the new lieutenant, if you put him in a combat situation, then the tolerance for failure is lower. The mistakes that the lieutenant might have made during training become career-enders when in a real-life situation.

In an organization such as MARCORSYSCOM, there is no training environment. Marines and civilians who work at MARCORSYSCOM attend training, but there is no environment in which mistakes and failure can occur. From the time Marines or civilians go to work at MARCORSYSCOM, they are expected to put the product that is being worked on in the hands of the Marines within time, scope, and budget. Running over on budget, not meeting critical time lines, and making the product bigger or smaller than what the scope dictates results in potentially catastrophic outcomes. Marines and civilians at MARCORSYSCOM run the risk of being fired, of having the product canceled, of having funding taken away, and of being subject to a congressional investigation or oversight. The lack of a training environment carries over to other Marine Corps organizations such as Headquarters Marine Corp (HQMC); Command, Control, Communications, Computers, and Intelligence (C4I); and Marine Corps Recruiting Command (MCRC).

The fundamental trade-off between exploration and exploitation is summarized below in Figure 6:

Exploration Domain	HIGH	Flexibility Agility Risk Taking	Flexibility Efficiency Risk Accepting Standard Roles
	LO	Not Flexible Not Efficient Risk Adverse No Standard Roles	Efficiency Standard Roles Risk Adverse
		LO	HIGH
		Exploitation Domain	

Figure 6. Middle Ground between Exploration and Exploitation

Figure 6 illustrates the gap that occurs between the exploration and the exploitation domains, which is the intersection of the high areas in the chart. Falling into the high classification within the exploration domain allows the organization to be agile, flexible, and willing to take risk, but being in this box prevents the organization from taking advantage of efficiency and having standard roles for employees that would allow the organization to accomplish tasks irrespective of the employee within the organization. The middle ground takes advantage of both domains and appears to be the gap that is present within Marine Corps organizations. Marine Corps organizations lack an environment that fosters and allows for innovation while still allowing the day-to-day activities to take place without interruption. Marine Corps organizations need an environment that does not lean too far to the exploration domain, thereby thwarting the benefits of the exploitation domain, or too far towards the exploitation domain, forcing the sacrifice of the benefits of the exploration domain. Having an environment for innovation exploration would allow normal day-to-day activities to occur without interfering with what is going on with respect to innovation adoption. An innovation environment would also allow for ideas to be refined, tested, and experienced within the environment and then, if the potential for adoption into the organization is present, to move it over with an agreed upon set of standards and a well thought out methodology to the day-to-day activities.

B. SUMMARY

This chapter discussed fundamental issues in organizational behavior. Organizations preform a tradeoff between exploration and exploitation. Being heavily centered on either side of the tradeoff curve creates an inability to take advantage of the benefits of the other side of the tradeoff curve. The gap that is identified in the Marine Corps is the middle ground between exploration and exploitation. The eight practices are performed within this organizational context. The next chapter takes up the performance of eight practices in more detail.

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CHAPTER IV

A. BARRIERS TO INNOVATION ADOPTION

Before looking at methods to adopting innovations, it is important to understand the barriers that exist for innovation adoption. In his research on innovation barriers, Dew (2010) concluded “there is actually very little empirical research on innovation barriers.” (p. 5) He also states “most research that does exist is about perceived barriers and is tainted by survivor bias” (p. 5). Dew (2010) continues with identifying that “the most profound barriers to innovation are driven by deeper organization behaviors that are passive, not active resistors” (p. 5). Passive barriers are those “organizational elements that are predominantly designed for doing something else, not innovation implementation” (Dew, 2010, p. 5). Figure 7 illustrates how underlying passive organizational elements affect both enablers and barriers of innovation adoption.

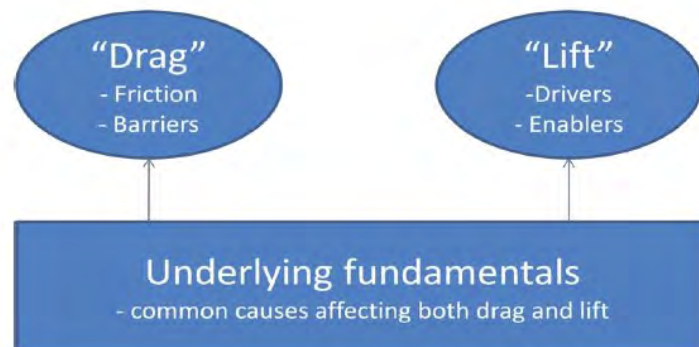


Figure 7. “Lift” and “Drag” in Innovation Implementation

(From Dew, 2010, p. 5)

Implementing innovation in practice is more difficult than innovating on paper and in theory. This difficulty is due to the friction that occurs within the organization and its environment and to the realities of when the paper plan first makes contact with the physical media. In the Marine Corps we call this the fog of war, the unknown factors that will affect the plan as laid out by the commander, and have either a positive or a negative effect. Friction, however, is not the only barrier to innovation adoption. Nicholas Dew

(2010) in his research illustrated that there are five barriers to innovation adoption: the complexity barrier, the bureaucracy barrier, the control barrier, the incentive system barrier, and the culture barrier.

1. The Complexity Barrier

What is important to understand about the complexity barrier is that innovations are varied and so are the organizations that implement them. Innovation variance depends on technology readiness levels (TRL), whether it is a process or a product, and how much technology uncertainty exists within the innovation. The amount of variance that exists within innovation can go on forever. The same holds true for organizations. Organizations that are keen on profit will structure and act very differently than a non-profit organization. The complexity for innovation adoption and success is because “every time an innovation implementation is considered, what you are really doing is fitting two unique artifacts together, which means the question of how well adapted they are to each other is key to the chances of success” (Dew, 2010, p. 7). Each innovation, therefore, has to be customized to the organization that is trying to implement it. This is further compounded because the implementation process has to be tailored based on the type of organization that is doing the innovation implementation and the different effects the innovation implementation process will have on the innovation (Dew 2010).

Overcoming the complexity barrier is dependent on understanding that there is an infinite number of innovation-organization combinations, so understanding all the possible combinations is difficult. According to Dew (2010) an innovator has to have an open mind and a understanding for each new innovation effort because there are varied methods that have to be established in order to adopt an innovation, and a cookie-cutter approach will not work. Dew (2010) states “what is needed instead are more flexible implementation approaches” (p. 7) when it comes to making an innovation compatible with an organization.

2. The Bureaucracy Barrier

There is a perception that a large bureaucracy is not as good at implementing innovation as smaller nonbureaucratic organizations. Lessons that I have received while

at the Naval Postgraduate School on organizational theory, organizational frameworks, and the best business practices for an innovative organization would suggest that bureaucracy is a barrier to innovation. As can be seen in some of the quotes from interviewees in Chapter II, employees within the workplace think that a bureaucracy is an impediment.

The problem with the perception that a bureaucracy is an impediment to innovation adoption is that there is another side to the bureaucracy argument. “The other half of the story—the half that is not perceived—is that several aspects of bureaucracy have large positive effects on innovativeness. Therefore, the net effect is that bureaucracy is both an enabler and a constrainer on innovation implementation” (Dew, 2010, p. 8).

An illustration of how bureaucracy can be an enabler and a constrainer of innovation adoption is how General James Mattis used the bureaucracy of the Marine Corps to establish the manual on counterinsurgency. The constraining factor of the bureaucracy is that it has the tendency to lead organizations into complacency. A recent news article about General Mattis described a speech he gave to new officers. General Mattis described the British Navy: “at the turn of the 19th century, it had no rival in the world, but 100 years later it had grown complacent in dominance. Officers amassed rules, ribbons, and rituals that had little to do with the changing nature of war. ‘They no longer had captains of wars,’ he tells them, ‘but captains of ships’” (Dickerson, 2011, n.p.g.) Bureaucracy constrained how the British Navy thought about fighting wars by leading to the development of rules that constrained the way that it looked at potential threats to the British Navy’s dominance at sea. But bureaucracy can be an enabler of innovation as well. “Mattis’ innovative approach to adapting to insurgent warfare where soldiers and Marines must ‘apply violence and chivalry often changing block by block’ helped inform the doctrine contained in the Counterinsurgency Manual that he co-developed with Gen. David Petraeus” (Dickerson, 2011, n.p.g.). The bureaucracy of the Marine Corps that is used to establish doctrine for the Marine Corps leveraged its deep and vast knowledge about counterinsurgency, and implemented an innovative solution to dealing with the problem. Implementing the new doctrine came at a cost that needed to be overcome,

however. There was friction within the Marine Corps while the new doctrine was being implemented, tested for the first time, and so forth.

3. The Control Barrier

Dew states, “one of the oldest known facts in research on innovation is that bureaucratic control of employee behavior is a barrier to organizational innovation” (Dew, 2010, p. 9). This fact has been studied on numerous accounts and is represented in the following quote:

In the latest meta analysis, 33 studies published in top research journals (1990-2009) were analyzed representing a sample of almost 600,000 employees: employee autonomy was found to have a very stable and sizable positive relationship with innovation indicating that its inverse - controls that limit employee discretion - has a stable negative relationship with innovation. (Dew, 2010, p. 9)

This becomes problematic for an organization such as the Marine Corps. Strict adherence to the chain of command is required, especially in an operational environment, but this control also has a limiting effect on the actions needed in order to preform innovation adoption. Three reasons why tight controlling mechanisms impact innovation adoption seen in the list taken from Dew’s (2010) research are:

- *Demotivates employees*: perceived control is an important motivational variable in human behavior: the less control you have, the less motivation you have to act. Innovation requires a lot of effort; therefore tight bureaucratic control results in an organization that demotivates employees from the kind of effort that implementing new projects requires.
- *Inhibits connecting and coordinating behaviors*: connecting and coordinating are critical activities of successful innovators. It is people who do the communicating and connecting in organizations, and high control organizations tend to make it harder for new connections and coordinating activities to develop spontaneously according to the new needs of innovation implementations.
- *Inhibits adaptation*: most innovations evolve via many small changes and their implementation requires a myriad of small (and sometimes large) organizational adjustments. However, control limits employees’ discretion to make the kind of continuous bottom-up organizational adaptations that assist implementations. (p. 9)

4. The Incentive System Barrier

Incentive systems are a critical part of human behavior, and as such they are “one of the top five most mentioned barriers to innovation” (Dew, 2010, p. 10), because the “management incentives [are] not structured to reward innovation’ (mentioned by 31% of respondents)” (Dew, 2010, p. 10).

Limitations to rewarding innovation within the Marine Corps would mirror the findings made by Dew (2010) in his research with the Navy. Dew (2010) describes that there are two problems with the incentive programs currently in use within the Navy. The first problem being, innovations take a long time and that the person who starts an innovation may not be around when the innovation adoption is completed; as a result, this person misses out on the reward given because more often than not, rewards are provided at the end of the innovation cycle. The second problem is that “individuals that are more attracted to and talented in the domain of innovation are likely to select into organizations that explicitly reward it” (Dew, 2010, p. 10). This is a problem for the Marine Corps because the “formal and informal reward systems are robustly tailored to incent operational performance, not innovation performance” (Dew, 2010, p. 10).

5. The Culture Barrier

Dew (2010) called the culture barrier “the mother of all incontrovertible facts about innovation implementation” (p. 11). The cultural barrier is touted as being the mother of all facts about innovation implementation because it has the largest impact and because it is the most widespread (Dew, 2010). The reason why innovation adoption is sensitive to the culture of an organization is because “support for innovation is the expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment” (Dew, 2010, p. 11). The cultural barrier is “most powerfully experienced at the local (work team) level, but also manifests at an organizational level in terms of perceived organizational climate for innovation” (Dew, 2010, p. 11).

The perceptions that employees have toward innovation adoption are based on two aspects. The first is “the motivation individuals get from their manager and co-

workers” (Dew, 2010, p. 11), and the second is “protection from the risk of failure” (Dew, 2010, p. 11). Innovations, and the adoption of them, are the product of a community accepting them into the fabric of their organization (Denning & Dunham, 2010). Trying to get the acceptance from all the people within a community or organization for a new innovation is very sensitive to the social and organizational circumstances of that community or organization (Dew, 2010). If an organization is not set up with the right social circumstances to encourage, motivate, and provide incentives for those pursuing the demanding and risky process of getting an innovation adopted, then innovators will not pursue them.

B. ORGANIZATIONAL CHALLENGES TO INNOVATION ADOPTION

In addition to the five barriers just outlined, how an organization is structured to deal with the tradeoff between exploration and exploitation becomes a factor when trying to implement the eight practices and be successful at innovation adoption. Since there are downfalls associated with being tightly aligned to either of the domains on the exploration/exploitation tradeoff curve, recent research suggest that organizational ambidexterity is the way an organization should be structured to take advantage of both the exploration and exploitation domain.

1. Organizational Ambidexterity

The balancing act that occurs in an organization between the explorative and exploitative domains is called organizational ambidexterity. Raisch and Birkinshaw (2008) examined a broad scope of literature about organizational ambidexterity across multiple domains and found that are three methods that enable an organization to manage the balancing act required between exploration and exploitation.

The first method is to have an organization that splits exploration and exploitation into separate business units, with each business unit having its own operating procedures, budgets, and rules and regulations and with the organization leadership maintaining the balance between the two separate business units.

The second method is to have one organization that splits its time between exploration and exploitation equally so that at different points in time the same organization is working on separate aspects of each domain.

A third method for balancing the exploration and exploitation domains is to outsource the exploration side of the business and to allow an independent organization to develop new innovations (Raisch & Birkinshaw, 2008).

Independent of the method that an organization chooses to use to strike a balance between exploration and exploitation, it must “engage in enough exploitation to ensure the organization’s current viability and to engage in enough exploration to ensure future viability” (Levinthal & March, 1993, p. 105). O’Reilly and Tushman (2004) agreed and stated that in order “to flourish over the long run, most companies need to maintain a variety of innovation efforts. They must constantly pursue *incremental innovations*, small improvements in their existing products and operations that let them operate more efficiently and deliver ever greater value to customers” (p. 1).

2. Marine Corps Organizations and Ambidexterity

The Marine Corps is organized of many suborganizations, each fulfilling a specific task or mission to accomplish the overall organizational goals of the Marine Corps. If analyzing each suborganization, it would be difficult to identify how that suborganization accomplishes the balancing act between exploration and exploitation. However, when taking a broader view of the Marine Corps as one organization, it is easier to identify that the way that the Marine Corps is organized to accomplish exploration and exploitation is clear. The Marine Corps is structured in much the same manner as discussed in the research by O’Reilly and Tushman (2004) about how organizations structure to balance themselves between exploration and exploitation. Figure 8 outlines how an organization can form to be ambidextrous. Each business unit is comprised of “structurally independent units, each having its own processes, structures, and cultures, but ... integrated into the existing management hierarchy” (O’Reilly & Tushman, 2004, p. 5).

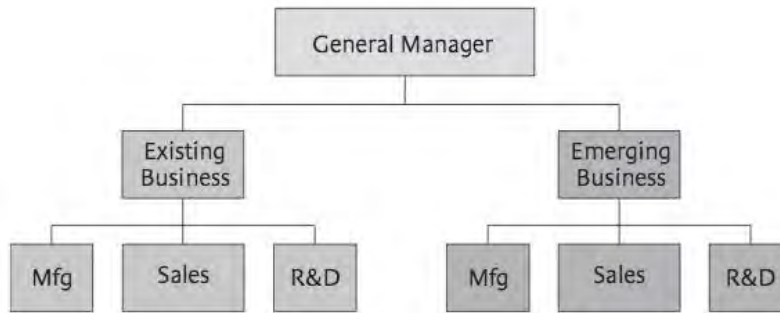


Figure 8. Ambidextrous Organizations

(From O'Reilly & Tushman, 2004, p. 5)

The organizational structure depicted in Figure 8 is the same organizational structure that is found in the Marine Corps and is illustrated in Figure 9. In the Marine Corps, the management hierarchy that exists to balance between the exploration and exploitative domains is Headquarters Marine Corps; the business unit that is closely tied to the exploration domain is MCWL, and the business unit that is closely tied to the exploitation domain is MARCORSYSCOM.

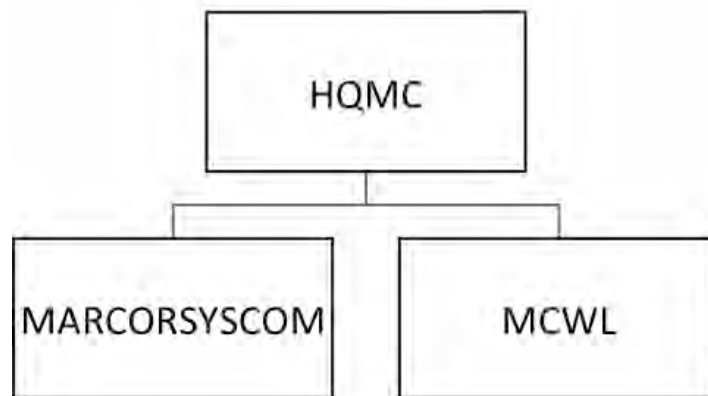


Figure 9. Marine Corps Ambidextrous Organization

3. Eight Practices in Ambidextrous Organizations

When trying to answer the research question asked in this paper the answer of “it depends” often comes to mind. This answer occurs because there are a lot of variables that must be taken into consideration. When looking at the eight practices and then trying to apply them to a functioning organization that has been established to accomplish a specific task, how the eight practices are applied to them varies depending on the level of efficiency required by the organizations and on the level of risk that is allowed to be taken to successfully adopt the innovation. Figure 10 illustrates a view of how technical uncertainty and risk of failure relate when looking at innovation adoption.

Technological Uncertainty	H	Med Efficiency Med Success	Low Efficiency Low Success
	L	High Efficiency High Success	Med Efficiency Low Success
		L	H
		Risk of Failure	

Figure 10. Tradeoff between Risk and Uncertainty

An example of how efficient organizations implement low-risk innovations is how the DoD has dealt with technology transition and developed specific programs suited for low-risk innovations and high-risk innovations. As seen in a 2005 GAO study, the Advanced Concept Technology Demonstration (ACTD) program was initiated “as a way to get technologies that meet critical military needs in the hands of users faster and at less cost than the traditional acquisition process” (p. 5). The study continued, “military operators test prototypes that have already been developed and matured in realistic settings” (GAO, 2005, p. 5). Within the ACTD program, efficiency is seen in the

constraints of time and money, and the technology that is being implemented is low risk because it is already mature (i.e., it is already being used somewhere else). In the end, if there is no need for the technology, then the “DOD may choose to buy additional quantities or just use the items remaining after the demonstration” (GAO, 2005, p. 5). The ability to buy additional quantities of the technologies, or abandon them if there is no benefit from them, make long-term sustainment of the technology only necessary if the technology is going to be used for the well into the future which results in saved resources such as money and time.

The difference between low risk of failure in an innovation and high risk of failure in an innovation is important for several reasons. First, if an innovation has a high level of technical uncertainty and a high level of risk failure, then that innovation will require an organization that is closely tied to the exploration domain. Being tied closely to the exploration domain requires the eight practices to be implemented in a much different manner than what would be necessary in an organization that is closely tied to the exploitation domain. An example of how the practice would be implemented differently is Google and how it goes about the practice of sensing. As mentioned earlier, each engineer is required to spend 20% of his or her time working on individual innovations (Denning & Dunham, 2010). This works for an organization that is tied to the exploration domain because it allows it to look for new innovations at every turn irrespective of the efficiency of the organization. Spending 20% of an employee’s time on individual efforts would be problematic in an organization that is closely tied to exploitation because in highly efficient organizations, every percentage of time is associated with accomplishing the mission of the organization with no room for those activities that do not affect the organization’s ability to accomplish its tasks. In other words, employees in highly efficient organizations are not employed to do any activities outside of what is required to accomplish the mission of the organization.

The second reason that requires the eight practices to be implemented differently within an ambidextrous organization is that each business unit requires some but not all of the eight practices. This means that all of the eight practices need to be present in the larger organization, but the suborganizations may only use or need part of the eight

practices. For example, those practices closely aligned to innovation (sensing, envisioning, and offering) would be present in the exploration business unit, and those practices more closely aligned with adoption (adopting, sustaining, and executing) would be found in the exploitation domain. The practices that are required for both business units, such as leadership and embodiment, would be found in both organizations as well as in the management business unit. It is safe to say that because the eight practices are tied to each other, there exists a point at which the practices bleed into each of the separate business units. For example, the practice of offering could be present in both the exploration and exploitation domains at different times depending on the maturity of the offer.

4. Identifying Potential Breakdowns

Appendix C identifies some of the potential risks associated with implementing the eight practices within the different business units. While there are 20 potential risks identified, this list is not an end-all be-all list. The assumptions that were taken when developing this list were as follows: on some level, organizations know and understand the basic practices even if they do not express them in the same terms used by Denning and Dunham (2010); in some cases, an innovation requires adoption before the risk can be realized; some risks can span multiple practices, so the best fit between the risk identified and the practice that would most likely fail if the risk was realized was chosen to avoid duplication. Additionally, consideration was taken when looking at the probability of the risk occurring. For example, in the sensing practice, it was identified that failure to think the current process is a problem a risk concern. The risk probability that was assigned to this potential risk is *unlikely* because, for the most part, employees know when there is a problem within the process that they are required to use; it seemed logical that the risk concern identified would have a low probability of occurring. When looking at the negative impact on the innovation becoming adopted, consideration was given to the fact that in some cases, such as sustaining, the innovation had already been adopted, so the impact on whether the risk concern would have an impact on the innovation being adopted was low.

e	L	M	H	H	H
d	L	M	M	H	H
c	L	M	M	M	H
b	L	L	L	M	M
a	L	L	L	L	M
	1	2	3	4	5

Impact on Innovation Adoption

Figure 11. Risk Identification

Figure 11 illustrates four high-risk areas that would have a negative effect on an innovation adoption effort and were identified in Appendix C. The four practices that are tied to these high-risk areas are the practices of envisioning, offering, adopting, and executing. The common denominator between all of the practices identified as high-risk areas is communication. The practice of envisioning is being able to sell the story about how the innovation will benefit the organization and about what the means are to get to the desired end state. The offering practice is centered on the communications that occur between the individual presenting the idea to the community and on the discussions that take place to develop methods to get the idea adopted. The practice of adopting is also grounded in communications because it is all about building the initial commitment to try the new innovation and building up value in the innovation within the community. The executing practice deals with communications because the practice is centered on managing commitments, resources, and building teams that enable an innovation to become adopted. Based on the fact that the four high-risk areas address the topic of communications, a tool that would enable better communication would be beneficial for an organization attempting an innovation adoption effort.

C. UNDERSTANDING BARRIERS TO INNOVATION ADOPTION

Once a person who is trying to become better at innovation adoption understands the barriers to innovation adoption, they are better prepared to succeed at it. The innovator learns how to overcome the barriers to innovation and can develop solutions that will result in higher success rates in their innovation adoption efforts. The solution for adoption is as varied as the number of organizations and types of innovations trying to

be implemented, understanding this barrier allows for the organization to look at their innovation adoption efforts with a more rounded view. The use of unrestricted communication between innovators is another key factor to an innovation's success, and a major contributing factor to overcoming many of the innovation adoption barriers. The bureaucracy barrier can be overcome once there is an understanding how to take advantage of what the bureaucracy has to offer to achieve an innovation adoption success. Overcoming the cultural and incentive barrier will lead to successful innovative adoptions when the organizations offer, proper incentives, motivation, and a culture that supports innovation.

D. EIGHT PRACTICES OF INNOVATION IN A FRAMEWORK

Innovation adoption is difficult, and developing a single framework or model for innovation adoption is even more difficult. The reason for the difficulty of developing a single framework or model for innovation adoption is varied and ranges from the uniqueness of the innovation that is being adopted to the structure and culture of the organization. Probably the most important aspect that defines the difficulty in innovation adoption is the tradeoff that occurs between the exploration domain and the exploitation domain. The tradeoff that occurs often results in an innovation not meeting its full potential because resources are taken away from the innovation to fund the day-to-day operations, or the reverse happens in which the day-to-day operations are weakened at the expense of the innovation.

In the 2005 GAO study, three DoD technology transition programs were looked at: the Technology Transition Initiative (TTI), the Defense Acquisition Challenge Program (DACP), and the Quick Reaction Fund. Each of these programs were started in an effort to get innovations into the hands of the warfighter faster and at less cost. The study infers that a requirement exists for some type of framework that will assist in quicker innovation adoption and to identify areas within a program where processes and procedures that are not enabling quicker technology transfer. The excerpt from the GAO (2005) study identifies that:

It will be important for the programs to have effective processes for selecting projects, to ensure that the best possible candidates are chosen and that the technologies themselves are ready for final testing and evaluation stages. It will also be vital that they instill effective management and oversight processes, so that they can identify and correct problems before they throw projects off track and so that they can sustain acquisition program commitment. In addition, given the importance of enhancing technology transition within the DOD and the expectation that the investment in these programs will grow, it will be important for all three programs to demonstrate to others that they are providing a worthwhile return on investment. (pp. 3–4)

A solution to speed innovation adoption within organizations, and to address the findings in the GAO (2005), an organization could use the eight practices, appropriately applied. The use of the eight practices is useful as a framework because it allows for flexibility in how the practices are implemented within the organization while still providing a critical lens to determine any gaps that the organization may have in its innovation adoption processes. Denning and Dunham (2010) provided an assessment tool within their book (pp. 385–387) to determine how good an organization is at the use of the eight practices. At a minimum, the results of this assessment tool can provide the user with some sort of identification of the potential gaps that exist within their organization that need to be addressed.

1. Eight Practices of Innovation Adoption Framework

Denning and Dunham (2010) describe the eight practices for innovation adoption as being universal to all innovation adoption attempts, nonsequential in how the practices are used and implemented, and that by using the eight practices an organization begins to embody the practices and improves on how to implement the practice the next time. They also state that innovation is a process. Thinking of the eight practices as nonsequential events, but relating them to a process is a difficult concept to understand because when the average person thinks about a process they think in terms of a process having a starting point, a middle, and an end. For example, for the process for baking cookies, the starting point is getting the ingredients together according to a recipe, the middle is mixing all the ingredients together and putting the batter in the oven to cook, the end of the process is the finished cookie that can be eaten. Having a framework that

took the eight innovation adoption practices and put them into a framework that had a starting point, a middle, and an end, would help in visualizing how the eight practices work together to facilitate innovation adoption initiatives. Figure 12 illustrates the eight practices organized within a framework that I developed in order to depict how the eight practices could be used for and innovation adoption process.

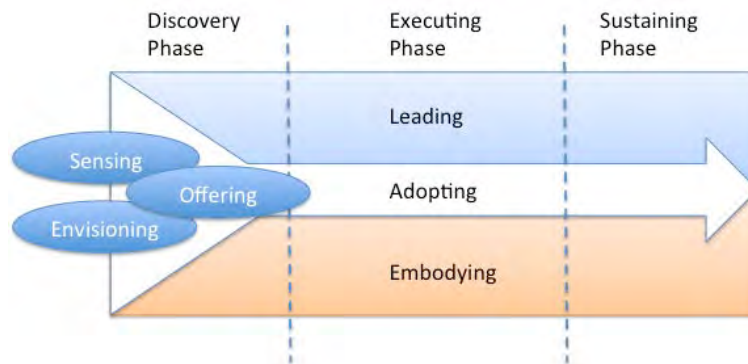


Figure 12. Eight Practices Innovation Framework

The eight practices innovation framework is broken into three phases: Discovery phase, executing phase, and the sustaining phase.

The discovery phase includes the practices that are centered on the discovering new ideas, technologies, or ways to improve processes, and how those ideas and new technologies are offered up to those within the community that are going to adopt the innovation. The discovery phase consists of the methods that would be used for the practices of sensing, envisioning, and offering such as: Creating a system to capture new ideas from employees, and listening to customer feedback to improve existing innovations, and using quad charts to communicate the idea or technology to decision makers and stakeholders.

The executing phase consists of the practice of executing and includes all the methods that can be used to bring an idea to a final product or process improvement. A couple of examples of the methods used for the execution practice are: The acquisitions cycle, the systems engineering process.

The sustaining phase consists of the practice of sustaining. A couple of examples of the methods used for the sustaining practice are: End of life-cycle management used within the governments acquisitions procedures, and listening to customer feedback in an effort for improving the innovation to meet current demands by those customers.

The practices of leading, offering, and embodying occur throughout the framework. The practice of leading for example is an enabler for the other practices to occur within the framework. An example of the leading practice in the discovery phase would be establishing an incentive program that rewards the generation of innovation ideas. In the execution phase of the framework the leading practice is demonstrated by how the leader motivates and encourages their employees in their innovation effort as well as how they manage the resources that are available to them for the innovation adoption effort. The practice of adopting also exists throughout the framework because it deals with retelling the story to stakeholders and key decision makers on the benefits of the innovation being adopted, and selling the story of the end state that could exist if the innovation is adopted. The last part of the framework that exists through the framework is the practice of embodying. The reason that practice of embodying exists throughout the framework is because as the organization attempts an innovation, or uses one of the other practices, learning occurs and the organization becomes more proficient in the use of that practice.

The benefit of the framework in Figure 12 is that it can be applied to any organization and innovation irrespective of the organization being closely aligned to the exploration or the exploitation domains, and innovations being low-risk or leap ahead innovations. The reason for this is that the framework is a guideline to focus the organization on the process of innovation adoption and to ensure that they have something that is being done to optimize each part of the framework. The indifference that the framework has towards organizational culture, incentive systems, and other innovation barriers, make it possible for the organization to analyze the processes, policies, systems, and other items that the organizations is using for an innovation adoption effort and visualize what part of the framework is missing or in need of improvement.

For example, if an organization took the framework and identified that they had nothing in place for the sustaining practice, the organization could develop something like a customer feedback process that took ideas from the customers and then improve on the innovation that is in use, or decide that the innovation is no longer needed and then abandon it. Another example would be the organization that identified that they had a process in place for executing, but realize that they were constantly over schedule on the delivery of their innovations. Using the framework the organization could look at all of the activities that that happen in each phase for how all the activities relate, and then optimize them to shorten the time line, or implement better methods within the adopting practice so that they can tell the story on why it is taken longer better.

2. Methods to Use within the Eight Practice Framework

Figures 13 through 20 illustrate possible methods that could be employed by an organization within the framework depicted in Figure 12 in order to satisfy each of the eight practices within a government organization. For example, Figure 17 depicts the mind map for the practice of sensing, and some of the possible solutions for the sensing practice are: Developing a system that collects new ideas from the employees within the organization, and using attending industry days to identify new technologies that are being developed by government contractors and companies in the industrial sector.



Figure 13. Sensing Mind Map

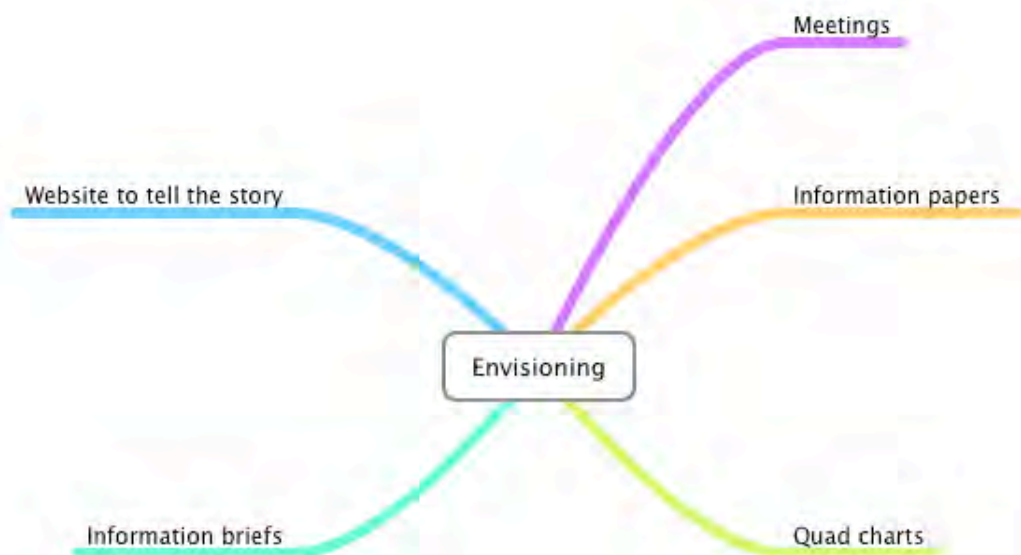


Figure 14. Envisioning Mind Map

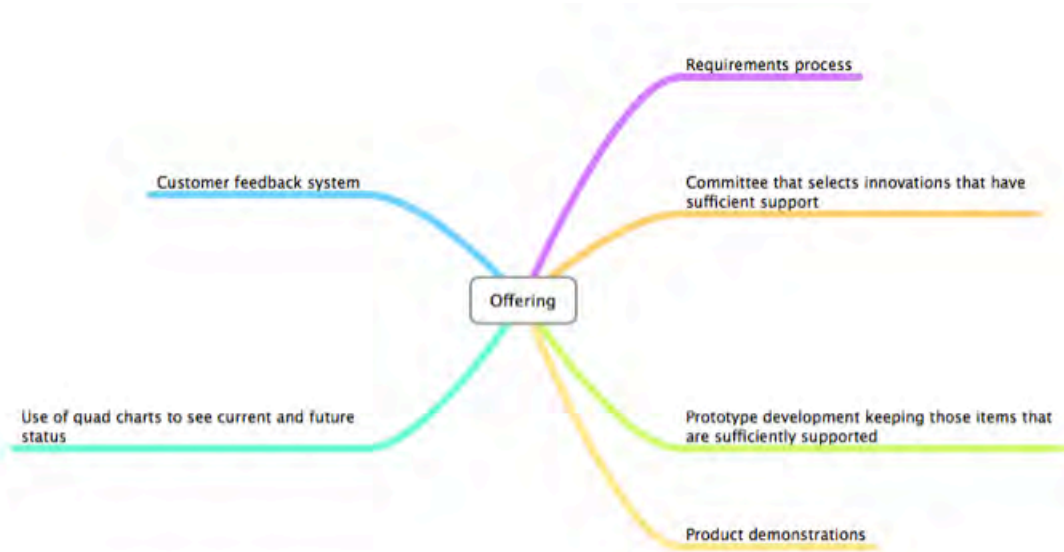


Figure 15. Offering Mind Map

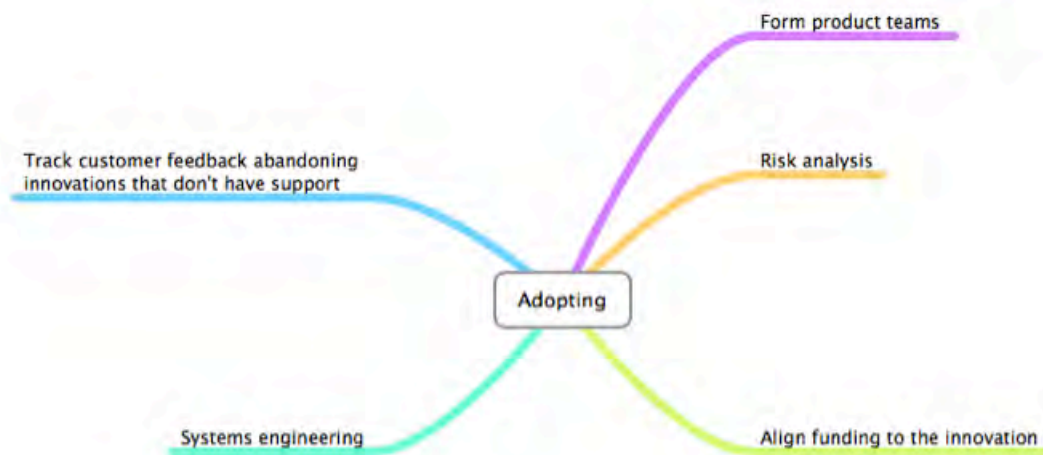


Figure 16. Adopting Mind Map

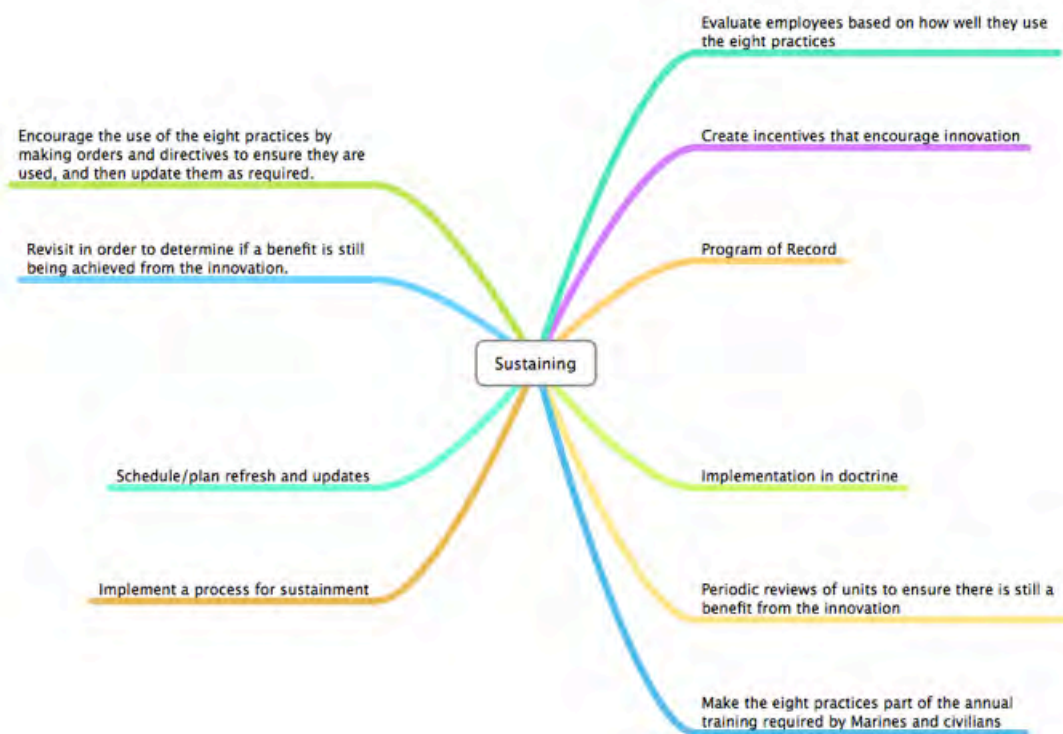


Figure 17. Sustaining Mind Map

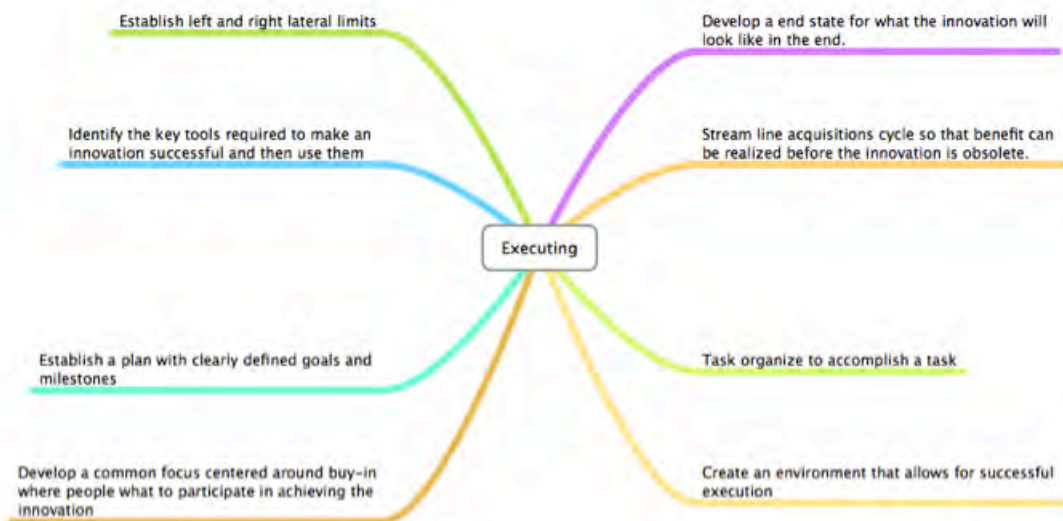


Figure 18. Executing Mind Map



Figure 19. Leading Mind Map

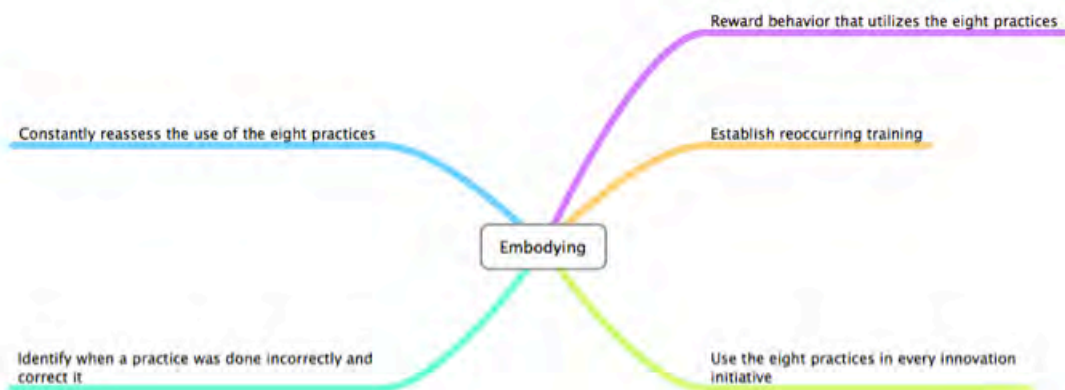


Figure 20. Embodying Mind Map

I generated these methods for each of the practices illustrated in Figure 13 through 20 using a brainstorming technique in which I took any idea that could provide a possible solution and entered it on a document. The a priori assumption I made when developing these methods was that regardless of the business unit being tightly aligned to exploration or exploitation, there exists a requirement for a little bit of both exploration and exploitation to be present in any business unit (Raisch & Birkinshaw, 2008). An example of how a business unit has to be grounded in both exploration and exploitation is that even though a business unit is closely tied to being efficient, the business unit still needs to look for innovations that improve processes and that make it more efficient. An organization that is closely aligned to exploration still needs to be efficient in its budget decisions because funding is not unlimited. Therefore, it is logical that a little of both exploration and exploitation need to be present in regard to implementing the eight practices. The difference is that the implementation method will change depending on what tradeoff is required to maintain an even keel within the organization.

a. Marine Corps Planning Process (MCP) for Executing

Additionally, I gave consideration to processes and procedures that are currently present and functioning within an organization. Organizations find it easier to adopt a practice if they take something that is already being done within the organization well and modify it. Executing, for example, is something that Marines do quite often (and many observers would say, do very well). For Marines, the practice of executing is the product of the Marine Corps Planning Process (MCP). MCP is a solid, proven, and well-tested method for developing a plan that will eventually be executed by some organization within the Marine Corps. MCP takes into consideration all the requirements of a conversation that are necessary to move an innovation from the innovation domain to the adoption domain that Denning and Dunham (2010) discussed in their chapter about executing.

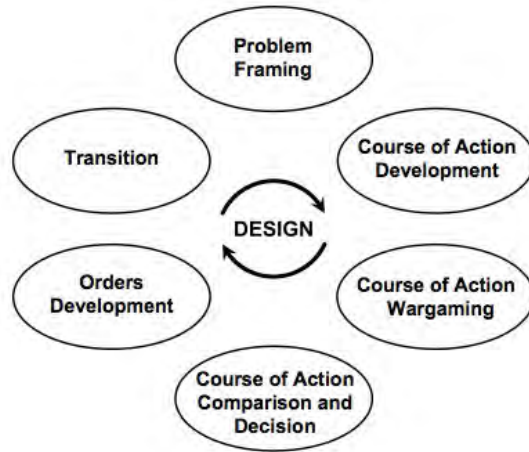


Figure 21. Overview of the Marine Corps Planning Process

(United States Marine Corps, 2010, p. 1-1)

Figure 21 provides an overview to MCPP and illustrates how a planner flows through the cycles. MCPP starts with framing the problem in front of the planner that needs to be addressed, then flows through the rest of the cycle, and ends with transitioning a finished plan for execution (United States Marine Corps 2010). In innovation, executing is doing everything that is required to bring an innovation from a possible offer to a promise delivered (Denning & Dunham, 2010). MCPP provides a solid example of how the Marine Corps can take a tool that it already has and use it for innovation adoption. MCPP forces an innovator to look at what is required for an innovation adoption effort, at what is available in the way of resources and processes to implement the innovation, and to make a determination about the desired end state and vision for what the innovation can provide.

b. Quad Charts as a Communications Tool

As another example of taking something that is being used and introducing the use of it in a way that would facilitate the use of the eight practices for innovation, and to address the communications issue that was identified in Figure 11, an organization could employ the use of quad charts. In a study about quad charts and how they are utilized, Stamey and Honeycutt (2005) stated,

The Department of Defense Instruction 5000.2 (dated May 12, 2003) prescribes for paper studies to look at alternative concepts for technology development. [2] Quad charts are a good match for rapid development of alternative concepts in technology and software development. The utility of quad charts has recently surfaced in other areas including executive reviews, databases of research material, and project management. [3] Recently, Six Sigma companies have found the usefulness of quad charts in project selection [4]. (p. 322)

Using the quad chart as a method for communicating allows the person selling the new idea to put all of the key information onto one page that is easily read and viewed by all of the people involved. The quad chart can also be used to easily identify who has the next action in the innovation adoption cycle, when the action is required to be completed, and the benefits and risks of adopting the innovation. All the components of the quad chart enable communication and decision-making because the quad chart provides all of the information needed on one page. The information on a quad chart should lead to one of three decisions being made: (1) accept the idea as-is and implement; 2) table the idea (there is not enough value in the idea, so moving forward with it will spend resources unwisely); or (3) refine the idea (there is merit in the idea, but more information is required; therefore, it will be looked at again at an agreed upon time). Quad charts can also be used to track the ongoing progress of newly implemented ideas. Figure 22 provides an example of a quad chart used for communicating a new idea for a decision, how it could be used to track the status, and what next actions are required.

Project Title	
Background: <ul style="list-style-type: none"> One to three bullets on what it that is being introduced. Why it is being introduced. The key is to provide enough information to provide the background on the new idea. 	Benefits: <ul style="list-style-type: none"> One to three bullets about the benefits of the new idea. What impact does the new idea provide. Risk: <ul style="list-style-type: none"> One to three bullets about the potential risks of the new idea. What are the results of not implementing the new idea. Potential roadblocks
Schedule: <ul style="list-style-type: none"> Time line for implementation of the new idea. Status: <ul style="list-style-type: none"> Once a decision is made the current status is tracked in this area 	Participants: <ul style="list-style-type: none"> Those involved with the new idea. Funding: <ul style="list-style-type: none"> Where the money is coming from for the new idea.

Figure 22. Example Quad Chart

3. The Eight Practices of Innovation Adoption as an Assessment Tool

The framework for innovation adoption (Figure 12), illustrates a way of looking at the eight practices as a guide to identify what is and is not being done within an organization for each of the practices, but does not provide a method for making an assessment for how well an organization thinks they are doing. To enable the organization to look at what they are doing within the framework and then put it on a scale that allows the organization to determine how well they are performing each of the eight practices, the organization can use the assessment tool in Figure 23.

Practice	What we are doing	What Barriers are in place	What can be done to overcome the barrier	Assessment of the practice on a scale from 1 - 5
Sensing				
Envisioning				
Offering				
Adopting				
Executing				
Leading				
Sustaining				
Embodying				
Overall Assessment Total				

Figure 23. Eight Practices as an Assessment Tool

To complete the assessment of the organization using the tool provided in Figure 23, the user starts by identifying all of the processes, systems, policies, and ways that the organization implements the practice. After that is complete, the user will then fill in all of the barriers that cause the implementing method problems. The barriers column would consist of anything that causes strain on the implementing method being used effectively. Upon completion of the barriers column, the user enters all of the processes, procedures, systems, and ways that the organization has to overcome the barrier identified previously. The overcoming barriers column consists of activities that are currently being done within the organization, or activities that the organization could put in place to overcome the barrier that was previously identified. The last portion of the assessment tool is to provide a number 1 through 5 for how well the user thinks they are doing within the practice. Once this is done the user can determine how well they are doing within the specific practice, and by adding all of the assessment numbers up, they can determine overall how well they are doing by placing the overall number on a scale between 0% and 100%. Following typical grading rules, a number in the 90% to 100% range would indicate that the organization is doing well but needs some minor improvements within their practices to become better at innovation adoption, a number between 80% - 89% would indicate that the organization is doing ok, but needs more refinement within their

practices to improve in innovation adoption, and a number in the 70% - 79% would indicate that the organization is average, and requires a lot of refinement within their practices to improve in their innovation adoption efforts. Numbers that range below 69% would indicate that the organization is performing the practices below average, and would need to embark on significant improvements within the ways that they implement the eight practices.

It is important to note that in order to provide a true assessment of how the organization is doing in each of the eight practices, the user of the assessment tool must be honest and willing to provide a true value on how well the organization is performing the practice. For example, placing a score of 5 in the assessment box just because the practice is being done does not provide a true representation of how well the practice is being performed because the factors in the barriers column and the items identified in what actions are being done to overcome the barriers column were not considered.

E. SUMMARY

There are many potential benefits to using the eight practices for innovation adoption. Efficient organizations can become more efficient by adopting innovations that streamline processes and therefore reduce wasted resources. Additionally, use of the eight practices can improve communications both externally and internally in an organization because there is a focus on articulating a benefit possible and turning it into a promise delivered. One of the most important benefits gained from implementing the eight practices is the ability to overcome the five barriers to innovation that were discussed in the beginning of this chapter.

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CHAPTER V

A. CONCLUSIONS

1. Main Findings

The major finding in this research is that individuals within MARCORSYSCOM preform actions based on the procedures, SOPs, and rules of their organization. The way that they operate falls in line with the principles and practices of organizations discussed by Allison and Zelikow (1999). In order to implement the eight individual practices of innovation adoption into an organization, careful consideration needs to be taken to determine how the practices can be meshed with the prevailing way MARCORSYSCOM does “business.”

Another finding of this research is that organizations need to balance how they manage the tradeoff between the exploration and exploitation domains. Better still, they need a high degree of ambidexterity, some of which might be offered by implementing the eight practices into MARCORSYSCOM’s organizational behavior. Organizations that are closely tied to the exploration domain still require some innovation thinking in order to implement improvements to their processes and to become more efficient, and organizations that are closely tied to the exploitation domain require some level of efficiency because resources are limited. Additionally, a key contingency discussed is the level of risk associated with the innovation becoming adopted correlates to the amount of efficiency an organization must use in order to have a successful innovation. An organization that is highly efficient may implement low-risk innovations but, in contrast, may have a difficult time adopting an innovation that is very low in technical maturity.

An additional finding is in the answer to the question posed in this research of how the eight practices apply to the Marine Corps, or could potentially be applied. The finding is that the eight practices provide a framework for the Marine Corps to realize the gaps that currently exist within its organizations when it comes to innovation adoption. Additionally, use of the eight practices can be used as a tool to improve communications between individuals, groups, and other organizations as well as to develop better ways to

move an offer into a promise delivered. As a guideline, the use of the eight practices may help develop organizations and individuals into organizations or individuals that are thinking about how to adopt innovation instead of being watchers of innovations being adopted.

2. Limitations in Research

Like all research, this thesis has limitations. The first limitation of this research was the low correlation between the answers given by the interviewees and the eight practices. This low correlation may be the result of the interviewees not understanding the eight practices and, therefore, not being able to articulate their answers in a manner that linked well to the practices, or the low correlation may be an indication that the way that the questions were designed was confusing and did not lend itself to an answer that could be easily tied to the eight practices. However, the end result is that there is no empirical data that ties the eight practices to the way they are implemented within an organization.

The second limitation of this research was my researcher bias. When I conducted the research, my beliefs on a specific topic could have been projected onto the person that I was interviewing. My beliefs, experiences, and thoughts on an innovation adoption may have also influenced the findings of this research. As a way of minimizing the effect of my personal bias on the topic, I read interview questions from a script, and provided alternate perspectives to how I thought innovation adoption should be accomplished.

The third limitation of this research was examining only one organization within the Marine Corps in order to understand how all Marine Corps organizations operate. Although great care was taken to generalize implementing procedures for the eight practices to the larger Marine Corps organization, some applications may relate only to a specific problem seen in the MARCORSYSCOM.

The fourth limitation of this research was the time constraints that restricted further discovery. After the first round of interviews and analysis was conducted and it was found that MARCORSYSCOM PMs responded to the questions in terms of what the organization's SOPs, guidelines, and procedures were, a second interview could have

been developed and executed to produce mappings of how MARCORSYSCOM as an organization implements the eight practices, but time constraints prevented this second interview.

The final limitation was the bias in others' research. Because this research built on research that was already conducted, bias that was present in the previous research is introduced in this research. An attempt to minimize this limitation was taken by looking at views from competing theories to gain a new perspective.

3. Recommendations for Future Research

A logical next step to this research on the eight practices and on trying to develop a methodology for them to be implemented into the Marine Corps would be to actually implement the practices and then test to see if they do in fact produce benefits.

One research thread that could be of use would be to look at a government organization outside of the DoD, such as DARPA, to see if the eight practices are employed; if so, are they employed on an individual level or an organizational one? If they employ the latter, how is their use of the eight practices different than a DoD organization? Additionally, what is the validity of the eight practices, and is there something within them that could be added or taken away to make the process of innovation adoption easier?

Another research thread could look more deeply at how the Marine Corps is organized as an ambidextrous organization. This research demonstrated a basic belief that the Marine Corps is organized in the manner illustrated by O'Reilly and Tushman (2004), but no empirical data was presented to prove this claim. Future research could analyze the different linkages between the three organizations—HQMC, MCWL, and MARCORSYSCOM—to determine the fit to an organization that is truly established as an ambidextrous organization.

A final research thread could identify the metrics that would be used to demonstrate the impact innovation adoption has on an organization from a cost savings, process and procedure, and schedule perspective. In the days of reduced budgets and

tighter purse strings, understanding the monetary impacts of innovation adoption could potentially save the USMC money. A better understanding of the savings involved might provide additional impetus for the USMC to implement organizational practices of the kind identified here, that would enable the corp to adopt innovations more efficiently and effectively.

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APPENDIX A. INTERVIEW SCRIPT

Hello, my name is Maj Scott Voigts. I have been in the Marine Corps for 16 years. Since being in the Marine Corps, I have managed projects on various levels and have been interested in how project managers do what they do. I have taken an opportunity while at the Naval Postgraduate School while working on my Masters Degree to look at this issue. Dr Nick Dew from the Naval Postgraduate School is the principle investigator, and Dr John Osmundson is my second reader and co-investigator for the study.

What I would like to do is ask you some background questions and then some questions specific to what you do as a project manager.

If you have no issue with answering the questions I would like to begin, do you have any objection?

If YES – Thank you for your time and I hope you have a good day.

If No—Proceed with question 1.

1. What is your current age?
2. How long have you served in a project manager billet/role?
3. What formal training have you had in project management?
4. What certificates or special training have you had in project management?
5. What government training have you received related to project management or managing government programs such as DAWIA?
6. What is the highest level of education and what degree(s) if applicable do you possess?
7. How many programs have you worked on? And of those how many have gone into full production?

8. Interviewee is shown a laptop PowerPoint presentation slide with a voice-over (60 sec) describing a new technology that might be relevant to the Marines and other DoD warfighters. The subject is then asked the following open-ended question – “based on your experience, if you were the project manager for this technology, how would you go about getting this innovation adopted in the Marines or elsewhere in the DoD?”

I now have some follow-on questions for you:

9. In general, in your experience, how do you identify there is an opportunity for you to get an innovation implemented in the Marine Corps/other DoD?
10. How do you go about shaping an effective vision for an innovative project?
11. In your experience how do you go about offering up an innovation for adoption by Marines/other DoD?
12. When a new system that you have developed becomes available, how do you get Marines/other DoD to try it for the first time?
13. How do you get an innovation to become permanently adopted in the Marines/other DoD?
14. In your experience how do you create an effective environment for executing an innovation project, i.e. delivering the promise?
15. In your experience, what leadership skills are involved in getting an innovation adopted?
16. Based on your experience, what are the most characteristic breakdown that cause innovations to fail to be adopted?

Thank you for your participation in the study, if you have further comments I can be reached at – savoigts@nps.edu

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APPENDIX B.

The results of the coding that were done to determine scores from interviewee answers about the eight practices.

Individual Coding Results

	2	4	5	6	7	8	10	11	12	13	15	16	17	19	20	21	
Age	49	47	65	30	42	44	50	51	48	38	45	43	60	54	45	56	47.9375
Number of years	7	3	31	1	14	3	15	12	15	5	8	3	11	25	7	10	10.625
Education	MBA	BS	BS	BS	BS		MS	MS	MS	MS	MS	MS	MS	BS	MBA	BS	
Numbers of projects	4	1	8	4	29	25	14	15	10	55	2	4	25	6	6	4	13.25
Slide																	
Q1	1	1	2	1	2	2	2	3	5	1	3	3	5	3	3	1	2.375
Q2	1	1	7	2	8	8	1	8	8	5	6	5	6	3	7	1	4.8125
Q3	6	2	6	3	8	5	1	9	7	3	1	5	5	4	8	5	4.875
Q4	7	5	2	1	8	6	3	7	7	1	5	3	4	5	6	5	4.6875
Q5	8	2	2	2	8	2	3	9	5	5	4	6	7	5	8	1	4.8125
Q6	2	6	8	2	8	6	4	6	8	6	5	4	6	4	5	5	5.3125
Q7	8	6	8	3	8	3	6	7	7	7	8	6	8	7	6	6	6.5
Q8	8	5	8	6	8	8	6	9	8	8	6	5	9	7	8	7	7.25

Organization Coding Results

Q1	6	7	7	3	7	7	4	6	8	3	8	7	6	5	7	2	5.8125
Q2	4	5	7	2	8	8	1	8	8	5	6	5	6	3	7	6	5.5625
Q3	7	6	6	8	9	5	3	9	7	3	3	5	5	4	8	8	6
Q4	8	5	4	5	8	6	5	8	7	7	7	6	7	6	6	8	6.4375
Q5	9	6	2	6	9	2	6	9	6	6	8	6	7	5	8	7	6.375
Q6	4	8	8	8	8	6	7	6	8	6	5	4	6	4	5	8	6.3125
Q7	8	8	8	5	9	5	6	8	7	7	8	6	8	7	6	9	7.1875
Q8	8	7	8	6	9	8	6	9	9	9	6	5	9	7	9	9	7.75

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APPENDIX C.

Appendix C is a risk analysis and impact the risk would have on an innovation being adopted.

Risk Area	Risk Concern	Risk Uncertainty	Risk Probability	Probability Level	Impact	Impact Level	Risk Level	Risk Mitigation
Embodying	People become complacent in innovation practices	Is there something in place to keep people interested in using the eight practices	Likely	c	Practices become routine and employees don't look for alternatives	3	Med	Increase efforts to use the eight practices in new ways
Adopting	Resistance to change	Is there something in place that tells the story of benefits of the innovation	Likely	c	Innovation will not become adopted	5	High	Develop methods that better enable the selling of an innovation so that the benefits can be more easily identified
Offering	Innovations not articulated clearly	Is there something in place that allows for clear understanding of what is expected from the innovation	Likely	c	No understanding in the innovation so innovation doesn't get consideration and benefits are not realized	5	High	Create a method that enables a conversation to take place between offer and receiver
Adopting	Falling in love with an innovation	Does the person/team insist on the innovation being implemented regardless of benefit	Likely	c	Innovation that has no benefit becomes adopted resulted in wasted resources	4	Med	Develop methods that allow employees to realize when there is no benefit from the innovation they are trying to adopt
Executing	Innovations that do not produce additional value	Does a metric exist that determines a minimum amount of value the new innovation must achieve in order to continue	Unlikely	b	Put more effort into adopting the innovation that what can be taken out as a return on the effort	4	Med	Establish clearly understood metrics that allow for analysis to occur to determine if the juice is worth the squeeze
Leading	Do what I say not what I do	Are those that evaluate employees held to the same standards for using the eight practices	Likely	c	Employees don't trust that their leaders know what they are talking about	3	Med	Increase the effort to evaluate up and down the chain of command in relation to the eight practices
Sustaining	Training that becomes routine	Are new methods and approaches to the eight practices explored and provided to employees	Likely	c	Employees go through the motions of attending training and don't understand alternate ways to implement the eight practices	3	Med	Develop methods where employees are able to demonstrate a working knowledge of the eight practices
Sensing	No method to collect/filter new ideas	Is there a collection solution in place, and is it routinely scrubbed	Likely	c	New ideas are not generated to be considered so the innovation process becomes stagnant	4	Med	Implement methods that collect new ideas and then filter out ideas that have been done, or are not applicable
Sensing	Failure to think that current process is a problem	Are employees so caught up in the process that they fail to see that there is a problem in the process	Unlikely	b	New ideas to improve processes are not realized	4	Med	Review process, policies, and directives on a routine basis and ensure there is still value added in them
Envisioning	Innovation is too complex	Is the innovation trying to fill too many holes	Highly Likely	d	Innovation grows to be over budget, over schedule, and doesn't hit milestones	5	High	Implement a tracking system to ensure that the innovation doesn't fall victim to requirements creep
Offering	Command climate that enables innovation	Is failure encouraged as a learning tool	Unlikely	b	Learning within the organization doesn't occur	3	Low	Ensure that failing at an innovation attempt is not criticized, but rather used as a learning tool for the next attempt
Envisioning	Lack of organizational ability to foster innovation	Is there something in place that creates an environment that fosters innovative thinking	Likely	c	New methods, procedures, and policies not realized	3	Med	Review process, policies, and directives on a routine basis and ensure there is still value added in them
Adopting	Lack of buy-in about the innovation	Is there a method in place to articulate an innovation in terms that encourage adoption	Unlikely	b	Innovation will not become adopted	5	Med	Develop systems/processes that allow for innovations to be communicated clearly
Sustaining	No plan for updates, and modifications external to organization	Is there a plan in place to keep the innovation up to date and current	Likely	c	Innovation falls by the way side and eventually becomes overcome by other events	3	Med	Establish a review system that ensures innovations are kept up to date with regard to current practices
Executing	No established evaluation criteria	Is there a clear criteria in place that allows for the innovation to be canceled if it doesn't achieve certain metrics	Likely	c	Resources are wasted on adopting an innovation that provides no benefit	3	Med	Establish clearly understood criteria that must be achieved for an innovation to continue to be adopted
Leading	Evaluation/focus on metrics that provide no value	Are we only looking at ROI of the innovation, or are we considering ROI and other metrics	Highly Likely	d	Measure metrics that have no bearing on the value of the innovation being adopted	3	Med	Create metrics that measure the right thing and produce results that have meaning to the innovation being adopted
Adopting	Using the wrong tool to implement an innovation	Is the way that the innovation is being adopted done in a manner and with a tool that will enable its adoption	Unlikely	b	Increased friction when trying to adopt an innovation	4	Med	Implement another tool if friction is realized in the current tool, or produce a tool that will reduce the adoption friction
Offering	No feedback system	Is there a system that takes feedback from the end user and uses feedback to improve the innovation	Unlikely	b	Improvements not made to existing innovations	2	Low	Implement a method that looks at feedback and then filters out those suggestions that will not provide any tangible benefit, and implement those that do produce a benefit
Leading	Failure to motivate and encourage innovators	Is there an incentive program in place that encourages risk taking and short term gains from innovations	Likely	c	Employees less willing to try innovation	2	Med	Increase efforts to encourage and motivate those who are trying innovation adoption
Executing	Loose interest in innovation due to length of time	Is there a method in place that allows for the innovation to be canceled if no benefit can be realized in a specified amount of time	Highly Likely	d	Resources get pulled from the innovation to fund other innovations	4	High	Clearly articulate to decision makers the benefits of the innovation and the technical uncertainty of the innovation being adopted

Impact	1
Minimal/None	2
Slight	3
Moderate	4
Significant	5
Unacceptable	

Probability Level	a
Remote	b
Unlikely	c
Likely	d
Highly Likely	e
Certain	

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